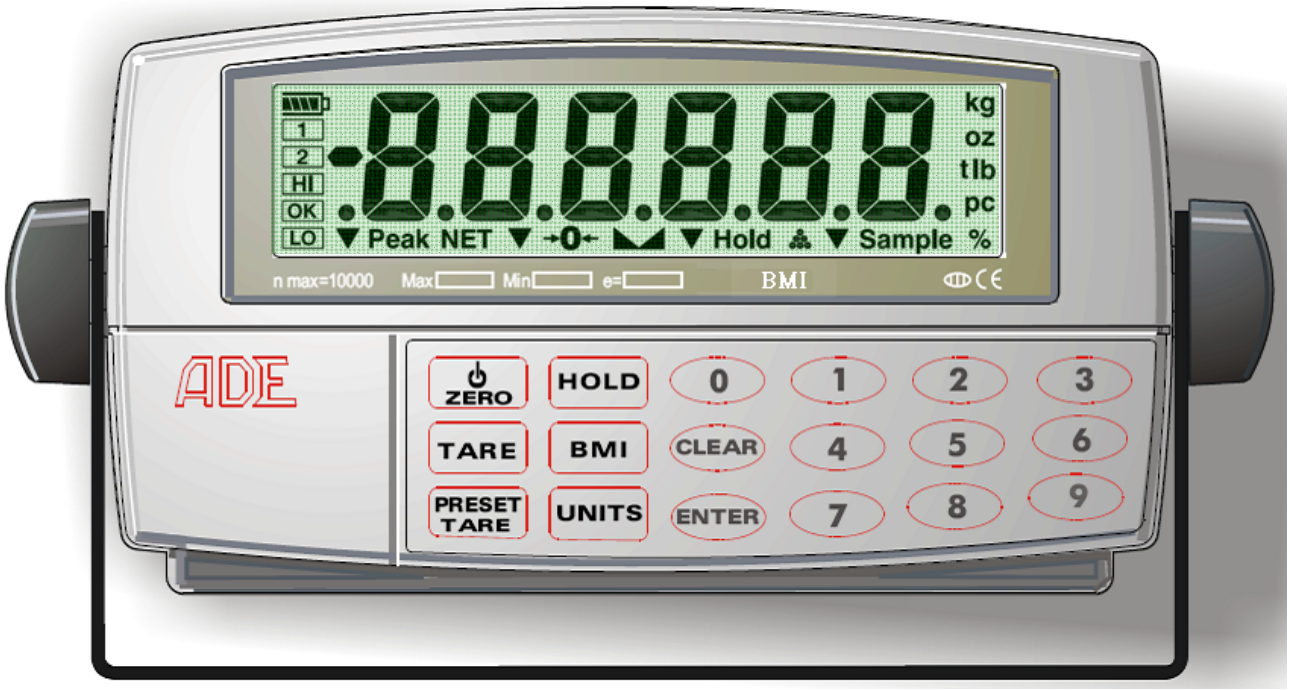
ADE-MAK

Body-Mass-Index Battery-Power Indicator

User Manual Instructions



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ADE (GmbH & Co.)

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1. Introduction

This manual contains installation, operation and maintenance instructions for the *ADE-MAK* Indicator. Please read this manual completely before installation and operation.

1.1. Description

The *ADE-MAK* is precision digital weight indicator, which has been designed for medical use in hospitals, by doctors or medical specialists and pediatricians.

The *ADE-MAK* digital weight indicator takes portability to a new level. Running on rechargeable battery Pack, this handy indicator allows operation in practically any location imaginable! Topping rivals in ease of use and performance, it features battery life up to 200 hours* and a configurable shunt-down mode that conserves battery power when not in use.

The *ADE-MAK* is precision digital indicators using the latest Sigma-Delta A/D technology to ensure extremely fast and accurate weight readings. The setup and calibration are digital, with a non-volatile security store for all setup parameters. The instrument may be operated from rechargeable battery pack or a DC power source. There is a soft power on/off function that retains memory of its state. Once an instrument is turned on it will automatically start up again if the external power is interrupted.

1.2. Features

- *Large 0.82", six-digit LCD display*
- *Powered by rechargeable battery for portability or Wall Adapter*
- *Charge circuit inside.*
- *Power for four 350Ω load cells or eight 700Ω load cells*
- *One full duplex, RS-232 communications (with Configurable Address)*
- *One half duplex RS232 /Current Port for Printer or for remote display.*
- *One 500-character print ticket formats*
- *Configurable shut-down mode and back light mode to prolong battery life*
- *Auto units convert. Flexible unit switching-lb/kg/oz/g*
- *Superior battery life of over 200 hours in Power saving mode. Up to 100 hours continuous battery operation with one 350 load cell.*
- *Simple calibration, Test and Setting via HyperTerminal program.*
- Tare weight setting with keys
- *One Pseudo Clock for print formats.*
- *Easy meet all kind of regulation.*
- *Suitable for 0.5mV/V to 4mV/V load cell with no jumper*
- *Overload/Underload display indication*
- *Battery Level Indication.*
- *Animal weighing function*
- *Three mode of Hold function*
- *BMI calculation and Configurable auto judge indication*
- *OPTION set point and remote switch*

1.3. Safety Precaution

For safe and dependable operation of this equipment, please comply with the following safety precautions:

- Verify that the input voltage range printed on the data label matches the local AC power to be used.
- Make sure that the power cord does not pose a potential obstacle or tripping hazard.
- Use only approved accessories and peripherals.
- Operate the equipment only under ambient conditions specified in these instructions.
- Disconnect the equipment from the power supply when cleaning equipment .
- Do not operate the equipment in hazardous or unstable environments.
- Do not immerse the equipment in water or other liquids.
- Service should only be performed by authorized personnel.
- This equipment is supplied with a grounded power cable. Use only with a compatible grounded power outlet.
- The use of accessory equipment not complying with the equipment safety requirements of this equipment may lead to a reduced level of safety of the resulting system.
- Locate this product away from other equipments that will generate electromagnetic or other interference.
- Before use the high-frequency surgical equipment, cardiac defibrillators and cardiac defibrillator-monitors, refer to the manufacturers' instructions for them.
- To avoid the risk of fire and electric shock, use only the AC/DC adapter of Group West, Model TRC-05-2000-M.
- Clean with dry cloth only. Do not use phenolics, which may cause patient skin burns if skin burns if inadequately rinsed off, or alcohol, which does not have sufficient cleaning/disinfection properties.
- RS232 port must be connected to SELV equipment. SELV equipments are those with low DC voltage.

type B applied part

1.3.1. Relay Option Safety Precaution

This equipment may have an optional DC Relay Option board installed. This option allows external device control to be coordinated to the Indicator's set point 1 & 2.

CAUTION: ELECTRICAL SHOCK HAZARD. REMOVE ALL POWER CONNECTIONS TO THE INDICATOR BEFORE SERVICING OR MAKING INTERNAL CONNECTIONS. THE HOUSING SHOULD ONLY BE OPENED BY AUTHORIZED AND QUALIFIED PERSONNEL, SUCH AS AN ELECTRICAL TECHNICIAN.

Before making connections to the Relay terminals, remove power from the system. If the system contains

an optional rechargeable battery system, be sure that the POWER/ZERO button is used to fully turn off the system after removing the AC power plug.

1.4. Operating Modes

The *ADE-MAK* supports the following modes of operation:

- **Normal (weighing) mode**

  Normal mode is the “production” mode of the indicator. The indicator displays gross or net weights as required, using the LCD annunciator described in Section 1.6 to indicate scale status and the type of weight value displayed. Once configuration is complete and a legal seal is affixed to the back of the indicator, this is the only mode in which the *ADE-MAK* can operate. See Section 1.7.1 for more information about normal mode operations.

- **Panel mode**

  Panel mode allows the time, date, consecutive number, and consecutive number start-up value to be set without entering configuration mode. To enter panel mode, press and hold the GROSS/NET key until the TIME menu is shown. See Section 1.7.2 for more information about panel mode.

- **Configuration mode**

  Most of the procedures described in this manual require the indicator to be in configuration mode, including configuration and calibration.

  To enter configuration mode, remove the large fillister head screw from the enclosure back-plate. Insert a screwdriver or a similar tool into the access hole and press the setup switch once. The indicator display changes to show the word CONFIG.

- **Test mode**

  Test mode provides a number of diagnostic functions for the *ADE-MAK* indicator. Like setup mode, test mode is entered using the setup switch. See Section 8.7 for more information about entering and using test mode.

1.5. *Front Panel Keypad*

Figure 1-1 shows the *ADE-MAK* keypad, LCD annunciator and Display.

The symbols shown blue color under the keys (representing up, down, enter, left, right) describe the key functions assigned in configuration and panel modes. In these modes, the keys are used to navigate through menus, select digits within numeric values, and increment/decrement values. See Section 3.1.2 for information about using the front panel keys in configuration mode.

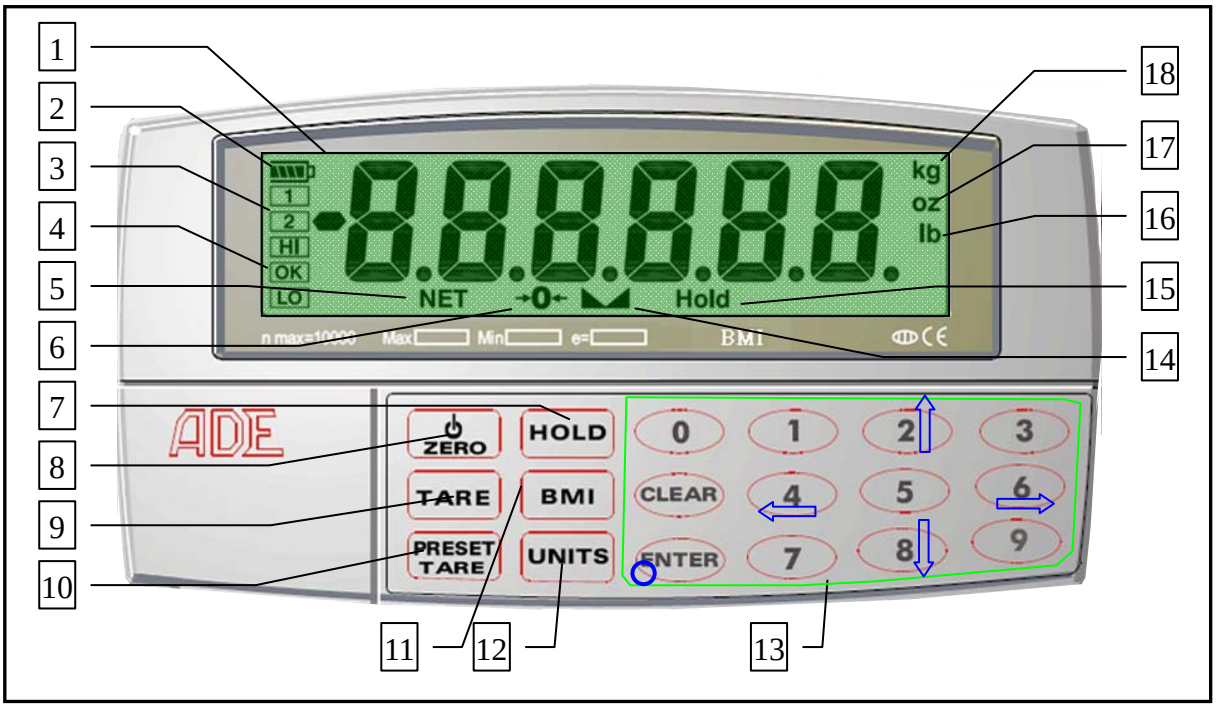


Figure 1-1 Front Panel and Display

NO.	Designation	Function
1	Display	LCD Display indicates weight, mode and configuration information.
2	Battery Level	Annunciator, indicate the batter's level.
3	Set point 1 ,2	Annunciator, indicate the status of set point 1 &2.
4	BMI judge	Annunciator, Automatic judge BMI
5	Net	Annunciator, The displayed weight is a net weight if light on otherwise is a gross weight.
6	Center of Zero	Annunciator, Gross weight is within 0.25 graduations of zero. This annunciator lights when the scale is zeroed.
7	Hold	Press active hold function.

8	Power/Zero	Turn indicator on or off. Secondary use, provides zero function.
9	Tare	Press the TARE key to acquire the weight of the scale as tare.
10	Preset Tare	Short press; Recall tare data. Long press; Enter tare value into memory.
11	BMI	Press, into BMI mod and enter height , Press again back to weighting mode.
12	Units	Press, toggle user definer's units.
13	Number Key Clear	Number key 0~9,Clear,Enter; for user enter number Clear the value. Except in weighing mode: "6" key represent "RIGHT" "4" key represent "LEFT" "8" Key represent "DOWN" "2" Key represent "UP"
	Gross/Net	In weight mode "0" key represent toggle gross or net weigh if tared in memory.
	Enter/PRINT	In weighing mode represent "PRINT" In other mode represent "DOWN" or "ENTER"
14	Standstill	Annunciator, scale is at standstill or within the specified motion band. Some operations, including zero, tare, and printing functions, can only be done when the standstill symbol is shown.
15	Hold	Annunciator, indicate display hold is active.
16	lb	Annunciator, the displayed weight is in pounds.
17	oz	Annunciator, the displayed weight is in ounces.
18	kg g	Annunciator, the displayed weight is in kilograms. Annunciator, the displayed weight is in grams.

1.6. LCD Annunciator

The *ADE-MAK* display uses a set of LCD annunciator to provide information about the value being displayed:

- Net (5) annunciator is lit to show the displayed weight is net weight. Otherwise is gross weight.
- Center Of Zero (6): Gross weight is within ±0.25 graduations of zero. This annunciator lights when the scale is zeroed.
- Standstill (Scale is at standstill or within the specified motion band. Some operations, including tare functions and printing, can only be done when the standstill symbol is shown.
- lb, kg, oz, and g (16, 17, and 18) annunciator indicate the units associated with the displayed value: lb=pounds, kg=kilograms, oz=ounces, g=grams.

The displayed units can set with primary unit and secondary unit; both units can be defining by user.

In weighting mode be toggle while Units key (12) press.

For example:

• If the primary unit is pounds (lb) and the secondary unit is kilograms (kg), the lb LCD is lit for primary units, kg for secondary units.

• If the primary unit is kilograms (kg) and the secondary unit is pounds (lb), the kg LCD is lit for primary units, lb for secondary units.

1.7. Indicator Operations

1.7.1. Weighing Mode Operations

Basic *ADE-MAK* operations are summarized below:

- **Toggle Units**

  Press the UNITS key to switch between primary and secondary units. The unit annunciator (16, 17, and 18) of the display is lit.

- **Zero Scale**

  1. In gross mode, remove all weight from the scale and wait for the standstill annunciator (◣◢
  2. Press the ZERO key (8). The center of zero (6) annunciator lights to indicate the scale is zeroed.

- **Acquire Tare**

  1. Place container on scale and wait for the standstill annunciator (◣◢
  2. Press the TARE key (9) to acquire the tare weight of the container. The indicator switches to net mode.

- **Remove Stored Tare Value**

  1. Remove all weight from the scale and wait for the standstill annunciator (◣◢
  2. Press the TARE key (9) (or, in OIML mode, the **ZERO** key). The indicator switches to gross mode, indicating the tare value has been removed.

- **Keyed Tare**

  1. Using the numeric keypad, enter the desired tare weight. Remember the weight is one of pounds/ Kilograms/ grams/ ounce whatever were set previously. If the number is not entered, the display indicates an "**ER TOUT** "; this is normal. The Indicator returns to a weighing mode automatically. If entered correctly, the tare weight is stored in the Indicator.

     Note: The Keyed Tare must be >0, and No limited on max.

  2. Press <**ENTER**>(or <**TARE**>) button, Indicator is now ready for weighing. The display shifts to net weight and shows the letters <**NET**> on the display.

- **Displaying Gross, Net, Tare**

  Pressing the <**0**> key successively displays the Tare, the Gross, and the Net weights. If a tare value has been entered or acquired, the net value is the gross weight minus the tare. If no tare has been entered or acquired, the display remains in gross mode. Net mode is indicated by the letters <**NET**> . The display tare weight is in flash digital ,and after one seconds the display shifts to gross weight.

- **Hold Display**

1. Wait for the standstill annunciator (◣◢(May be not need wait depend on selectable parameter)
2. Press the Hold key (7) to frozen the display. The Hold annunciator (15) of the display is lit.
3. Press the Hold key (7) again to back to weighing mode.

See Hold function section for detail.

- **BMI Display**

1. Press the BMI key (11) to enter BMI mode, the display should show the last entered value,
2. The operator could put body height (in cm) in a new value (13) or use the old value and press the Enter key (13). Or clear the value by Press the Clear Key (13).
3. After press the Enter key,
4. During the time (3 Min.) or Press the BMI key (11) to abort. The display will toggle between weight value and BMI value “b xx.x”, in toggle a fixed time of 2 seconds.

- **Recall Preset Tare**

1. Press "Preset Tare" key the unit will display “Pt x” and wait for entering a number (0-9). If after 5 seconds no number was entered - return to normal weighing mode.
2. After entering the number the *ADE-MAK* will recall the preset tare, display it for 5 seconds and switch to NET mode using the recalled PT value.

- **Preset Tare**

1. In order to program a tare value hold the Preset Tare key for 2 seconds. Then the *ADE-MAK* will show "ProPt x" and wait for entering a number (0-9).
2. Press a number key (0-9). This is the memory to be programmed.
3. The *ADE-MAK* will recall the preset tare, display it. Then enter the preset tare value and press "Enter”, **Note:** the format depend on PRI.DECPNT and SEC.DECPNT define, the units depend on display units,(may press Units key changed it)
4. The *ADE-MAK* will store the new value in the memory designated.

- **Print Ticket**

1. Wait for the standstill annunciator (◣◢
2. Press the ENTER key (13) to send data to the serial port.

Note: a. Zero net weight not allows printing.

b. The print function allows only one print, If without going through zero return point.

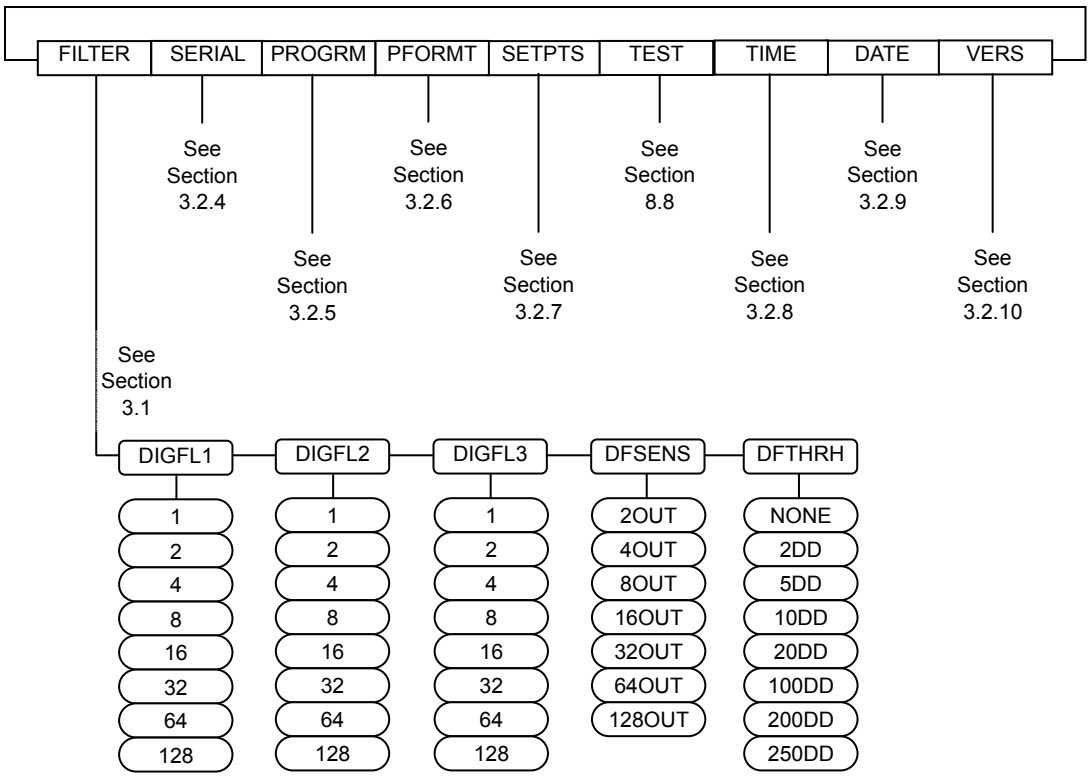
1.7.2. Panel Mode Operations

The following operations are available by placing the indicator in panel mode:

- Set serial port, non-metrological parameter
- Set time, date, consecutive number
- Set print format
- Set Set-points
- Test items

To enter panel mode, press and hold the CLEAR key (13) until the TIME menu is displayed. Use the navigation keys to move around the menu; to change a value, use the navigation keys to select the digit and increment or decrement its value. Press the Enter key to set the value and return to the menu level above. The structure of the panel mode menu show on below.

Note: *To enter a 2 digit month, the lower digit must be a "1" then the upper digit is incremented to "1". The lower digit can then be changed to 0, 1 or 2 as required.*



2. Installation

This section provides information for connecting load cell and serial communications cables to the *ADE-MAK* indicator.

2.1. Unpacking and Assembly

Immediately after unpacking, visually inspect the ADE-MAK to ensure all components are included and undamaged. The shipping carton should contain the indicator with attached tilt stand, this manual, and a parts kit. If any parts were damaged in shipment, notify Vishay and the shipper immediately.

The parts kit contains the items listed below:

- Capacity and identification labels
- Load cell connector
- Rechargeable battery (option)
- Power supply adapter

2.2. Enclosure and Connectors

The back of the ADE-MAK enclosure provides a 3-pin power connection, 15-pin HDB-sub connector for communications/IO, and an available 6-pin connector or load cell cord grip connector for load cell connection (see Figure 2-1). The setup switch, used for placing the indicator into configuration mode, is located in the recess on the underside of the enclosure. The setup switch is protected by a cover plate and secured with a fillister head screw (not shown in Figure 2-1).Pin Assign showing in Figure 2-2.

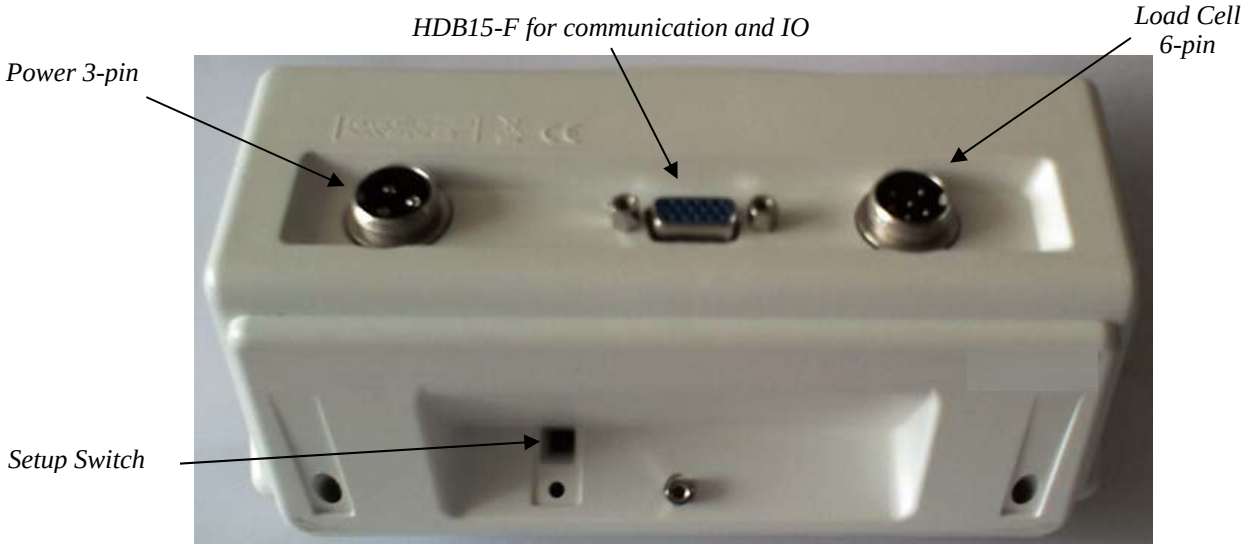


Figure 2-1 Back View of ADE-MAK Enclosure, Showing Load Cell Connector, Communications Connectors and Setup Switch Location

The female HDB15 connector provides connections for the EDP (Electronic Data Processing) port, the printer port and digital input/output.

Pin	Port	Function
1	Printer	RS-232 TxD
2	EDP	RS-232 TxD
3	N/C	not used
4	OUT1/2 COM	Set Point 1 &2 Common
5	OUT2	Set Point 2
6	EDP	RS-232 RxD
7	RSW1/2/3	Remote Switcher 1&2&3 Ground
8	N/C	not used
9	N/C	not used
10	OUT1	Set Point 1
11	Printer	TxD 20 mA
12	EDP/Printer	RS-232 Ground / –20 mA OUT
13	RSW1	Remote Switcher 1
14	RSW2	Remote Switcher 2
15	RSW3	Remote Switcher 3

Table 2-1 HDB15-F for EDP/Printer/Remote

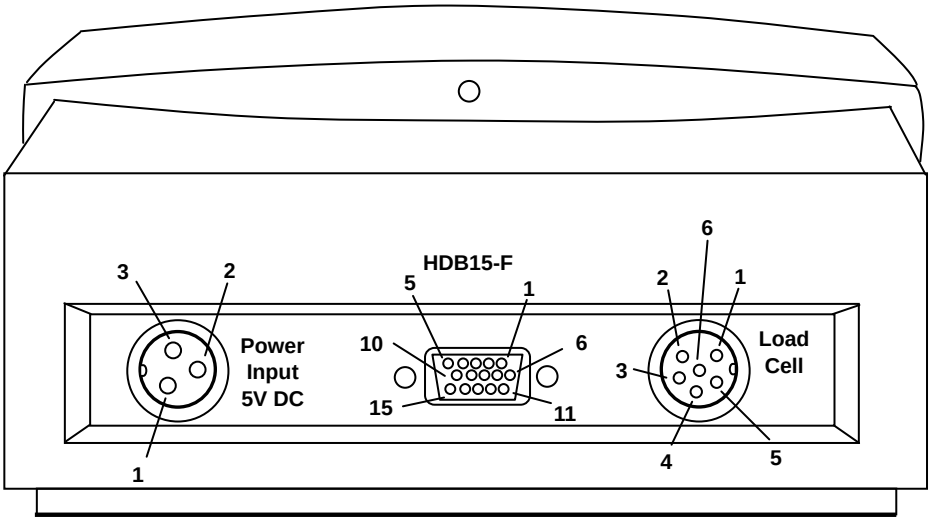


Figure 2-2 back View of ADE-MAK Enclosure, Showing Pin number configuration

2.3. Connecting the indicator to load cell

Load cell wires can be wired up indicator. Refer to the 6-pin connector instructions or the load cell cord grip plug instructions to connect to the load cell wires.

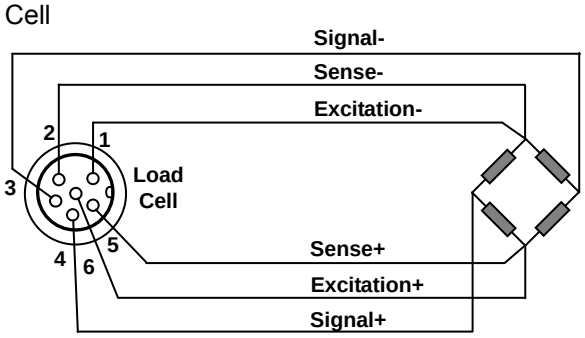
Load Cell Connector

Pin	1	2	3	4	5	6
Name	EXC-	SEN-	SIG-	SIG+	SEN+	EXC+

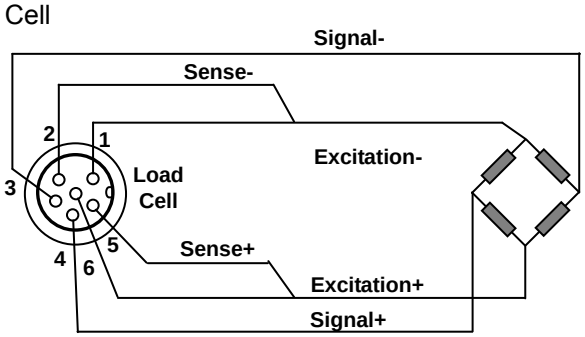
For 4-wire connections, short pin1 &2, short pin 5&6.

Refer to the color code of the load cell cable and connect the wires to “Load Cell Connector”. The connections are shown for a 6 wire cable. When a 4 wire cable is used, the Pin 1 &2 and Pin 5&6 must be short.

- Load Cell Connection
  - To 6-Wires Load Cell



  - To 4-Wires Load Cell



    For obtaining better performance, it is recommended to keep both short points as close to load cell as possible.

2.4. Connecting power

The *ADE-MAK* indicator may operate using the AC adapter, or a rechargeable Lithium Ion pack (Option).

2.4.1. AC adapter

Connect the AC adapter connector to the receptacle located at right-hand side of the indicator and plug the adapter into a convenient outlet. Notice the outlet/socket must be installed near the equipment and shall be easily accessibly. And must be used the dedicated AC adapter only.

Power Input pin assign

Pin	1	2	3
Name	DC+	DC-	Earth

2.4.2. Battery installation

Open the battery on the front of the housing.

Slightly pull out battery wires from housing, connect the wire with red-to-red, black-to-black. Insert the rechargeable batter into housing. Close the cover.

Notice: *Always use Vishay Original batteries and chargers. The warranty does not cover damage caused by using non-Vishay batteries and/or chargers.*

2.4.3. Battery tips

Battery life depends on the load, use frequency, temperature, setting, and accessories you use. Always use Vishay Original batteries and chargers. The warranty does not cover damage caused by using non- Vishay batteries and/or chargers.

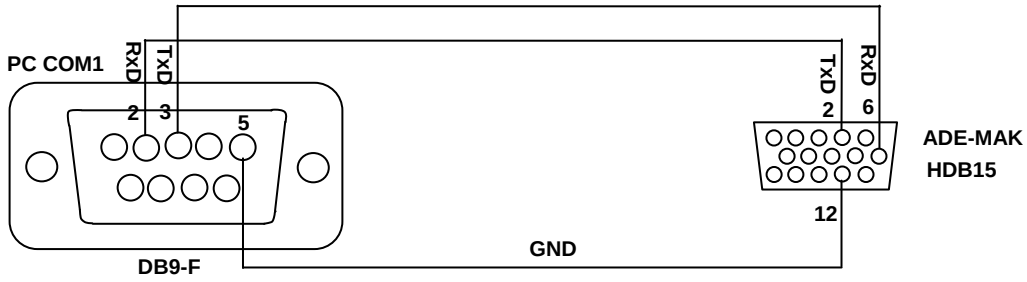
- New batteries or batteries stored for a long time may take more time to charge.
- When charging your battery, keep it near room temperature.
- When storing your battery, keep it uncharged in a cool, dark, dry place, such as a refrigerator.
- Never expose batteries to temperatures below -10°C (14°F) or above 45°C (113°F).
- It is normal for batteries to gradually wear down and require longer charging times. If you notice a change in your battery life, it is probably time to purchase a new battery.
- New batteries are shipped partially charged. Some batteries perform best after several full charge/discharge cycles.
- Do not dispose of used batteries in normal trash. Follow the proper disposal or recycling requirements in accordance with local laws and regulations.

Warning: Never dispose of batteries in a fire because they may explode.

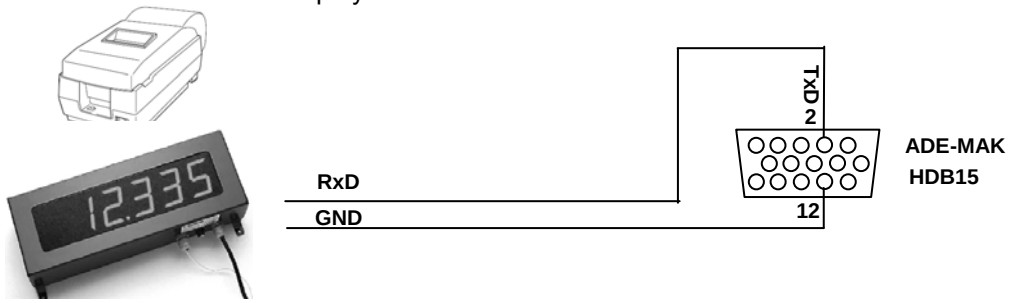
2.5. Connecting the RS232 interface

The serial communications cable attaches to the female HDB-Sub 15 pin connector (see Table 2-1). That provides connections for the EDP (Electronic Data Processing) port and the printer port. The EDP port supports RS-232 communications only; the printer port provides either active 20 mA output or RS-232 transmission. Both ports are configured using the SERIAL menu.

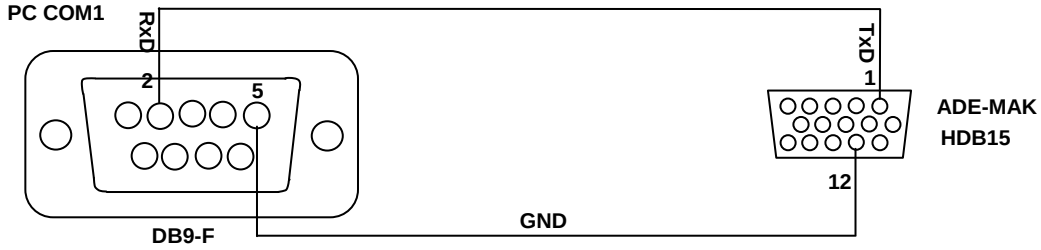
- EDP Port (RS232C, May be connect to PC, Printer, Remote Display)
  - To Personal Computer



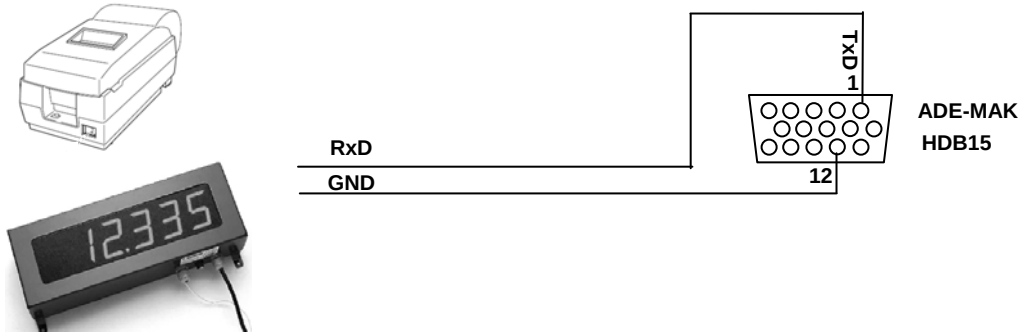
  - To Printer or Remote Display



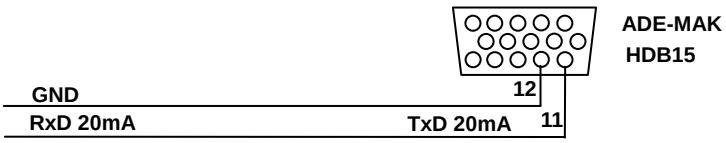
- Printer Port (TxD 20mA, May be connect to PC, Printer, Remote Display)
  - To Personal Computer (RS232C, *ADE-MAK* Stream Output)



  - To Printer / Remote Display (RS232C, *ADE-MAK* Print Function/Stream Output)



- To Printer / Remote Display (+20mA, *ADE-MAK* Print Function/Stream Output)



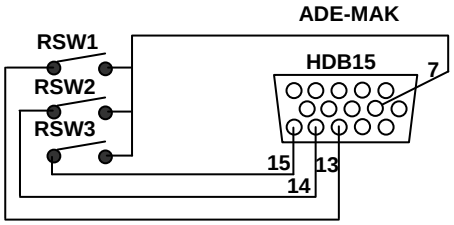
2.6. Connecting option IO interface

The option IO board provides three digital inputs and two solider digital relay out.

- Remote Switcher

The *ADE-MAK* Indicator has provisions to connect an external input device such as a press switch (purchased separately) to provide a membrane function. The membrane function can be set in the SETPNT menu; the external device must provide a normally open (N.O.) momentary switch contact.

The remote switch input requires a voltage free contact between RSW and GND.



WARNING
The remote input is a voltage free contact (eg. button, mechanical relay). Connection of any active circuitry may damage the instrument.

- Set Points Output

Output drivers for the *ADE-MAK* are isolated open emitter transistor drives that are capable of driving up to a total of 800mA.

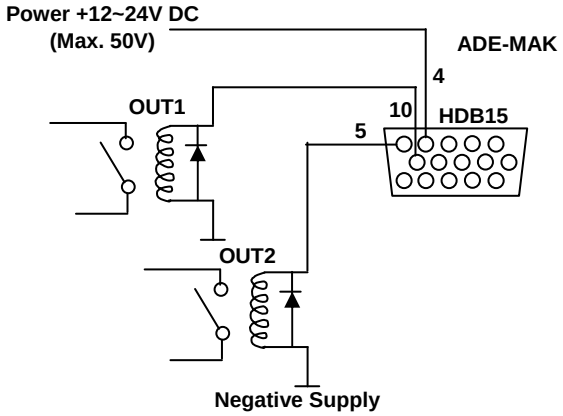
This configuration allows for the direct connection of the *ADE-MAK* outputs to most types of PLC.

The voltage applied to the COM terminal appears on the output lines (ie. OUT1 and OUT2) when the outputs are active (eg. To connect to a PLC connect +24V to the common terminal). The outputs can then be connected directly to PLC inputs so when the outputs are active the PLC will see a 24V signal.

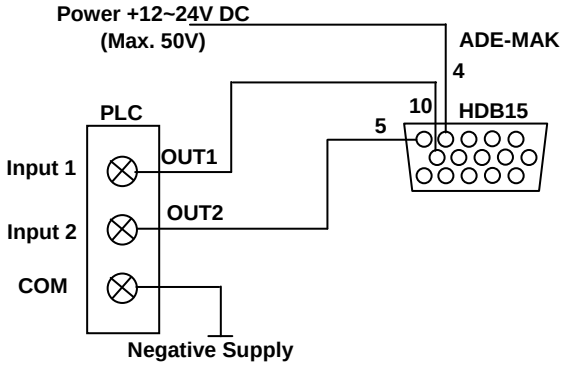
To drive external loads (eg. relays), connect the relay coil positive supply to the output common and the output line directly to one side of the relay coil.

Connect the other end of the relay coil to the negative supply. It is recommended that fly-back diodes or transient suppressors be fitted across relay coils to limit switching noise.

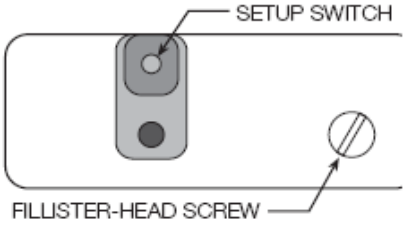
- Outputs to Drive Relay



- Outputs to Drive PLC



3. Configuration



To configure the *ADE-MAK* indicator, the indicator must be placed in Setup mode. The setup switch is accessed by removing the left fillister head screw on underside of the enclosure and removing the rectangular switch cover plate. Switch position is changed by inserting a screwdriver into the access hole and pressing the switch. When the indicator is placed in setup mode, the word *CONFIG* is shown on the display. The CONFIG menu is the first of nine main Menus used to configure the indicator. Detailed descriptions of these Menus are given in Section 3.2. When configuration is complete, return to the CONFIG menu and presses the ⇧ key to exit setup mode, then replace the setup switch access screw.

3.1. Configuration Methods

The *ADE-MAK* indicator can be configured by using the front panel keys to navigate through a series of configuration menus or by sending commands or configuration data to the EDP port. Configuration using the menus is described in Section 3.1.2. Configuration using the EDP port can be accomplished using the EDP command set described in Section 5.0.

3.1.1. EDP Command Configuration

The EDP command set can be used to configure the *ADE-MAK* indicator using a personal computer, terminal, or remote keyboard. EDP command configuration sends commands to the indicator EDP port; EDP commands can be sent using any external device capable of sending ASCII characters over a serial connection. EDP commands duplicate the functions available using the indicator front panel and provide some functions not otherwise available. EDP commands can be used to simulate pressing front panel keys, to configure the indicator, or to dump lists of parameter settings. See Section 5.0 for more information about using the EDP command set.

3.1.2. Front Panel Configuration

The *ADE-MAK* indicator can be configured using a series of menus accessed through the indicator front panel when the indicator is in setup mode. Table 3-1 summarizes the functions of each of the main menus.

Menu		Menu Function
CONFIG	*Configuration*	*Configure grads, zero tracking, zero range, motion band, overload, initial zero and digital filtering parameters.*
FORMAT	*Format*	*Set format of primary and secondary units, display rate.*
CALIBR	*Calibration*	*Calibrate indicator. See Section 4.0 for calibration procedures.*
SERIAL	*Serial*	*Configure EDP and printer serial ports.*
PROGRM	*Program*	*Set power-up mode, regulatory mode, shunt down method, back light, BMI judge, keyboard lock and consecutive number values.*
PFORMT	*Print Format*	*Set print format used for gross and net tickets. See Section 5.0 for more information.*
SETPTS	*Set Points*	*Set two Set points*
TIME	*Time*	*Display and set time*
DATE	*Date*	*Display and set date*
VERSION	*Version*	*Display installed software version number.*

Table 3-1. ADE-MAK Menu Summary

Four front panel keys are used as directional keys to navigate through the menus in setup mode. The ⇦ (13) and ⇨ (13) keys scroll left and right (horizontally) on the same menu level; the ⇧ (13) and ⇩ (13) move up and down (vertically) to different menu levels. The ENTER key (13) serves as an Enter key for selecting parameter values within the menus.

To select a parameter, press ⇦ or ⇨ to scroll left or right until the desired menu group appears on the display, then press ENTER to move down to the submenu or parameter you want. When moving through the menu parameters, the default or previously selected value appears first on the display.

To change a parameter value, scroll left or right to view the values for that parameter. When the desired value appears on the display, press to select the value and move back up one level.

***NOTE**:* You must press to save the selected value. The *ADE-MAK* does not automatically save the last-displayed value.

To edit numerical values, press ENTER (rightmost digit will *flash), then use the 0~9 keys and CLEAR key to edit the value. When done, press ENTER again to save the edited value.*

3.2. Menu Structures and Parameter Descriptions

The following sections provide graphic representations of the *ADE-MAK* menu structures. In the actual menu structure, the settings you choose under each parameter are arranged horizontally. To save page space, menu choices are shown in vertical columns. The factory default setting appears at the top of each column.

Most menu diagrams are accompanied by a table that describes all parameters and parameter values associated with that menu. Default parameter values are shown in bold type.

3.2.1. Configuration Menu

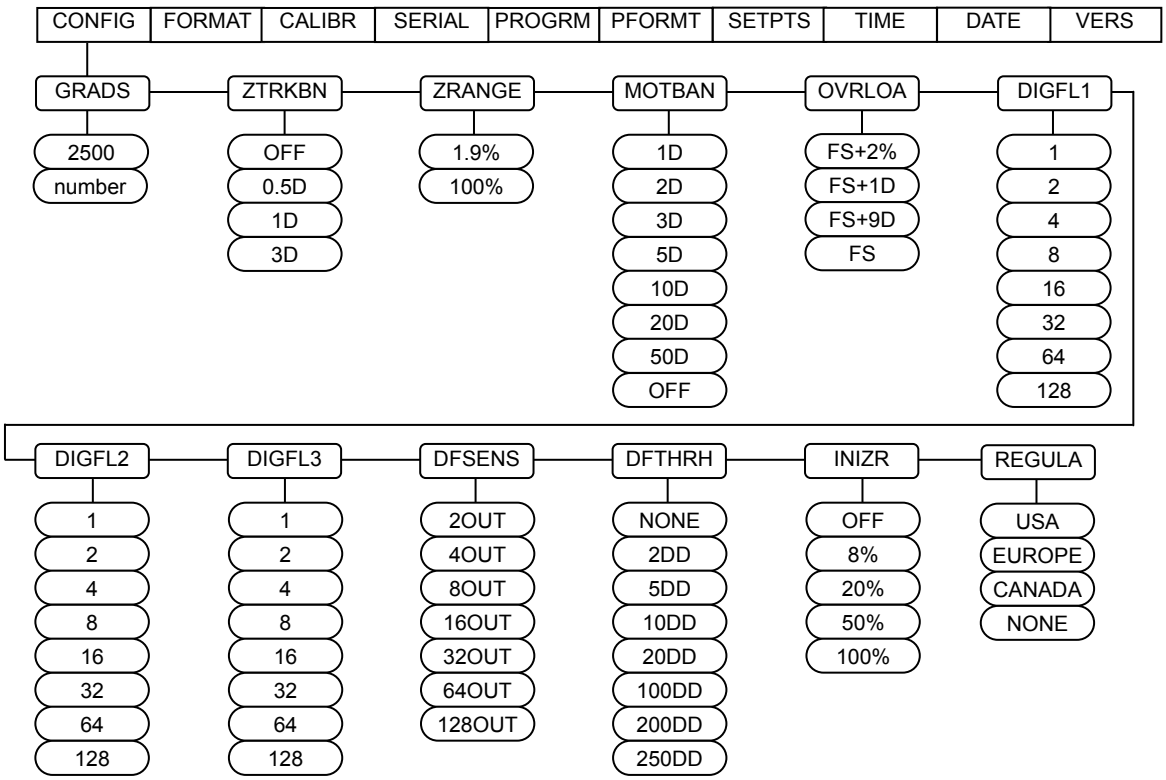


Figure 3-1. Configuration Menu

CONFIG MENU		
Parameter	**Choices**	**Description**
Level 2 submenus		
GRADS	**2500** *number*	Graduations. Specifies the number of full scale graduations. The value entered must be in the range 1–100000 and should be consistent with legal requirements and environmental limits on system resolution. To calculate GRADS, use the formula, GRADS = *Capacity* / *Min.Weight*. Where *Min.Weight = PRI.DSPDIV / PRI.DECPNT* *PRI.DECPNT* 888888 ---1 88888.8---10 8888.88---100 888.888---1000 88.8888---10000 8.88888---100000 *PRI.DSPDIV* 1D---1 2D---2 5D---5 10D---10 20D---20 50D---50 100D---100 200D---200 500D---500 For Examples GRADS=3000, *PRI.DSPDIV* =2D, *PRI.DSPDIV* =88888.8 Then *Capacity = 6,000, Min.Weight =2/10=0.2,and display with xxxxx.x*
ZTRKBN	OFF **0.5D** 1D 3D	Automatically zeroes the scale when within the range specified, as long as the input is within the ZRANGE and scale is at standstill. Selections are ± display divisions. Maximum legal value varies depending on local regulations.
ZRANGE	**1.9%** 100%	Selects the range within which the scale can be zeroed. The 1.9% selection is ± 1.9% around the calibrated zero point, for a total range of 3.8%. Indicator must be at standstill to zero the scale. Use 1.9% for Legal-for-Trade applications.
MOTBAN	**1D** 2D 3D 5D 10D 20D 50D OFF	Motion band. Sets the level, in display divisions, at which scale motion is detected. If motion is not detected for 1 second or more, the standstill symbol lights. Some operations, including print, tare, and zero, require the scale to be at standstill. Maximum legal value varies depending on local regulations. If OFF is selected, ZTRKBN should also be set to OFF.
OVRLOA	FS+2% FS+1D **FS+9D** FS	Determines the point at which the display blanks and an out-of-range error message are displayed. Maximum legal value varies depending on local regulations.
DIGFL1 DIGFL2 DIGFL3	1 **2** 4 8 16 32 64 128	Digital filtering. Selects the digital filtering rate used to reduce the effects of mechanical vibration from the immediate area of the scale. Choices indicate the number of A/D conversions that are averaged to obtain the displayed reading. A higher number gives a more accurate display by minimizing the effect of a few noisy readings, but slows down the settling rate of the indicator. See Section 8.7 for more information on digital filtering.

DFSENS	**2OUT** 4UT 8OUT 16OUT 32OUT 64OUT 128OUT	Digital filter cutout sensitivity. Specifies the number of consecutive readings that must fall outside the filter threshold (DFTHRH parameter) before digital filtering is suspended
DFTHRH	**NONE** 2DD 5DD 10DD 20DD 50DD 100DD 200DD 250DD	Digital filter cutout threshold. Specifies the filter threshold, in display divisions. When a specified number of consecutive scale readings (DFSENS parameter) fall outside of this threshold, digital filtering is suspended. If NONE is selected, the filter is always enabled.
INIZR	OFF **8%** 20% 50% 100%	Initial Zero Range. Define the range within which the scale can be zeroed while power on. The 8% means ± 8% around the calibrated zero point, for a total range of 16%. If power on while setting not 'OFF', *ADE-MAK* will wait until in the range of zero. And with a message "init".
REGULA	USA **EUROPE** CANADA NONE	Regulatory mode. Specifies the regulatory agency having jurisdiction over the scale site. •EUROPE, USA, and CANADA modes allow a tare to be acquired at any weight greater than zero. NONE allows tares to be acquired at any weight value. •EUROPE, USA, and CANADA modes allow a tare to be cleared only if the gross weight is at no load. NONE allows tares to be cleared at any weight value. •USA and EUROPE modes allow a new tare to be acquired even if a tare is already present. In CANADA mode, the previous tare must be cleared before a new tare can be acquired. • NONE, USA and CANADA modes allow the scale to be zeroed in either gross or net mode as long as the current weight is within the specified ZRANGE. In EUROPE mode, the scale must be in gross mode before it can be zeroed; pressing the ZERO key in net mode clears the tare.

Table 3-2. Configuration Menu Parameters

3.2.2. Format Menu

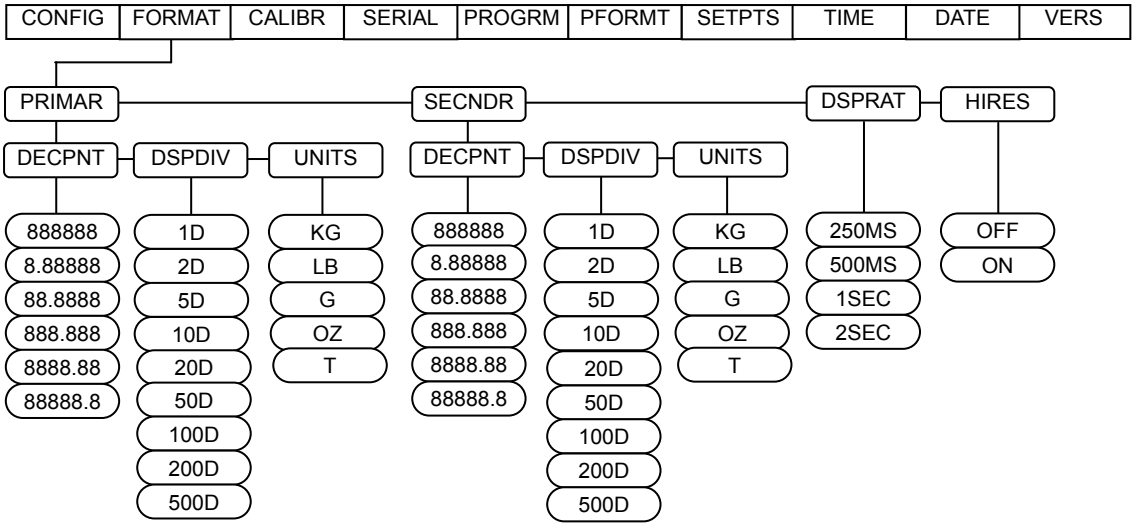


Figure 3-2. Format Menu

FORMAT MENU		
Parameter	**Choices**	**Description**
Level 2 submenus		
PRIMAR	DECPNT DSPDIV UNITS	Specifies the decimal position, display divisions, and units used for the primary units. See Level 3 submenu parameter descriptions.
SECNDR	DECPNT DSPDIV UNITS	Specifies the decimal position, display divisions, units. See Level 3 submenu parameter descriptions.
DSPRAT	**250MS** 500MS 1SEC 2SEC	Display rate. Sets the update rate for displayed values. Values are in milliseconds (MS) or seconds (SEC).
HIRES	**OFF** ON	Sets (ON) the instrument to display weight at 10 times resolution. This is intended for test purposes but may be used for non-trade weighing. Note: Don't using this parameter ON, if PRI.DECPNT='8.88888' or SEC.DECPNT='8.888888'
Level 3 submenus		
Primary Units (PRIMAR Parameter)		
DECPNT	888888 8.88888 88.8888 888.888 8888.88 **88888.8**	Decimal point location. Specifies the location of the decimal point or dummy zeroes in the primary unit display. Value should be consistent with local legal requirements.
DSPDIV	**1D** 2D 5D 10D 20D 50D	Display divisions. Selects the minimum division size for the primary units displayed weight.
UNITS	LB **KG** OZ G T	Specifies primary units for displayed and printed weight. Values are: LB=pound; KG=kilogram; OZ=ounce; G=gram ; T=metric tons
Secondary Units (SECNDR Parameter)		
DECPNT	**888888** 8.88888 88.8888 888.888	Decimal point location. Specifies the location of the decimal point or dummy zeroes in the secondary unit display. Value should be consistent with local legal requirements.

	8888.88 88888.8	
DSPDIV	**1D** 2D 5D 10D 20D 50D	Display divisions. Selects the minimum division size for the secondary units displayed weight.
UNITS	LB KG OZ **G** T	Specifies secondary units for displayed and printed weight. Values are: LB=pound; KG=kilogram; OZ=ounce; G=gram ; T=metric tons

Table 3-3. Format Menu Parameters

3.2.3. Calibration Menu

Also see Section 4.0 for calibration procedures.

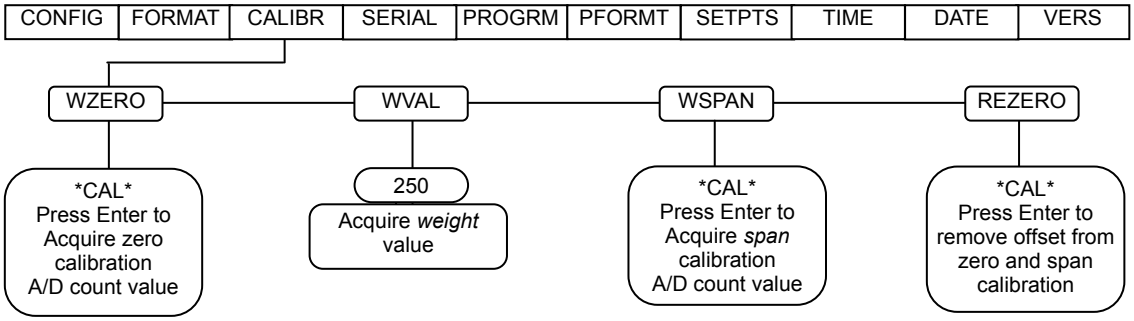


Figure 3-3. Calibration Menu

CALIBR MENU		
Parameter	**Choices**	**Description**
Level 2 submenus		
WZERO	-	Press Enter to Acquire the zero calibration A/D count value. DO NOT adjust this value after WSPAN has been set!
WVAL	**250** test_weight	Acquire the test weight value.
WSPAN	**-**	Press Enter to Acquire the span calibration A/D count value.
REZERO	**-**	Press Enter to remove an offset value from the zero and span calibrations. Use this parameter only after WZERO and WSPAN have been set. See Section 4.1 for more information about using this parameter.

Table 3-4. Calibration Menu Parameters

3.2.4. Serial Menu

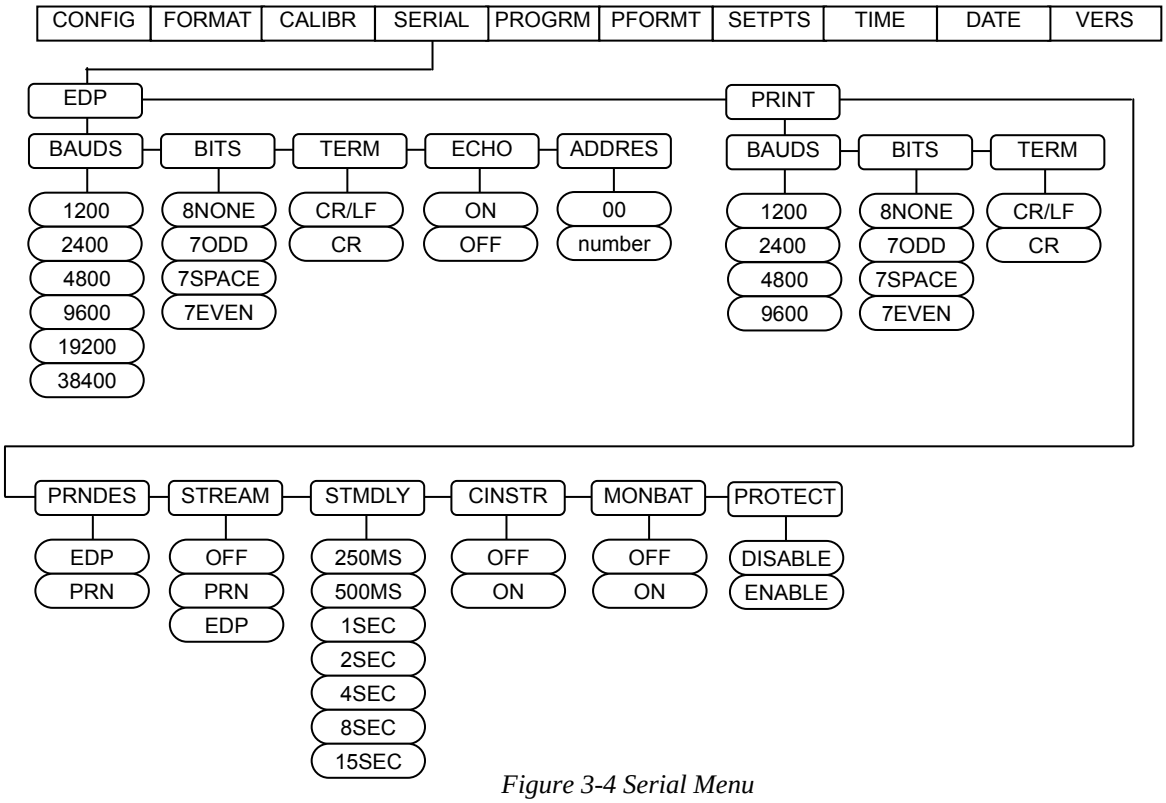


Figure 3-4 Serial Menu

SERIAL MENU		
Parameter	**Choices**	**Description**
Level 2 submenus		
EDP	BAUD BITS TERM ECHO ADDRES	Specifies settings for baud rate, data bits, termination characters, and RS485 address used by the EDP port.
PRINT	BAUD BITS TERM	Specifies settings for baud rate, data bits, and termination characters used by the printer port.
PRNDES	EDP **PRN**	Print destination. Selects the port for data transmission when the PRINT key is pressed or the KPRINT EDP command is sent.
STREAM	**OFF** EDP PRN	Selects the serial port used for continuous transmission. See Section 8.2 for information about the *ADE-MAK* continuous data format.
STMDLY	**250MS** 500MS 1SEC 2SEC 4SEC 8SEC 15SEC	Stream delay. Specifies the delay, seconds (SEC) or milliseconds (MS), inserted between stream frames.
CINSTR	ON **OFF**	Stream addition information with Raw data and time.
MONBAT	ON **OFF**	Stream addition information with battery data.
PROTCT	ENABLE **DISABL**	EDP port protection. Select ENABLE to secure the EDP port from configuration changes.
Level 3 submenus		EDP Port

BAUD	1200 2400 4800 **9600** 19200 38400	Baud rate. Selects the transmission speed for the EDP port.
BITS	**8NONE** 7ODD 7EVEN 7SPACE	Selects number of data bits and parity of data transmitted from the EDP port.
TERM	**CR/LF** CR	Termination character. Selects termination character for data sent from the EDP port.
ECHO	**ON** OFF	Echo. Specify whether serial commands sent to the indicator are echoed.
ADDRES	**00** *hh* *number in hex*	Specifies the node address of RS485. The value is in hex format. 00 represent disable this function.
Level 3 submenus		Printer Port
BAUD	1200 2400 4800 **9600** 19200 38400	Baud rate. Selects the transmission speed for the printer port.
BITS	**8NONE** 7ODD 7EVEN 7SPACE	Selects number of data bits and parity of data transmitted from the printer port.
TERM	**CR/LF** CR	Termination character. Selects termination character for data sent from the printer port.
LNGUGE	ENGLIS **GERMAN**	Ticket language. Selects the language for the printer ticket. English/ German GROSS/ BRUTTO NET/NETTO TARE/TARA HEIGHT/ GROESSE

Table 3-5. Serial Menu Parameters

3.2.5. Program Menu

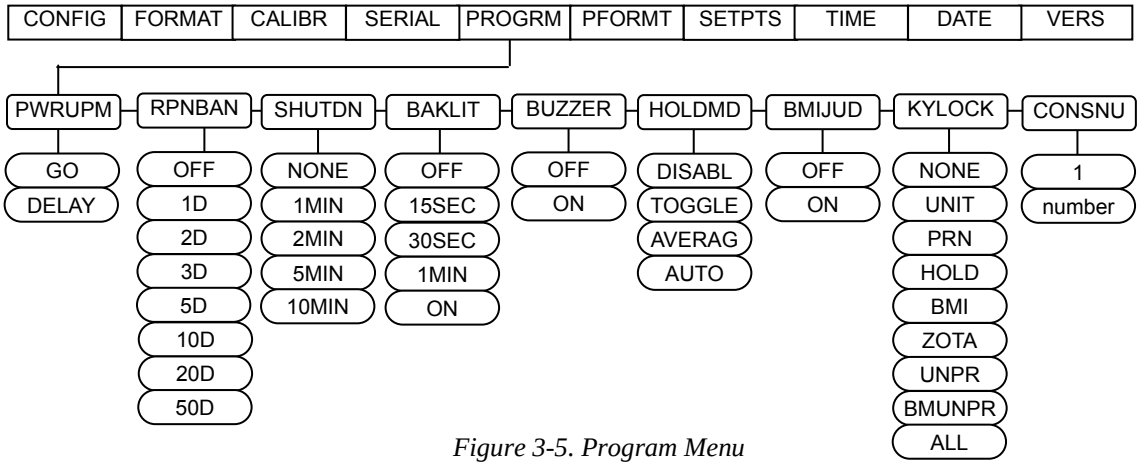


Figure 3-5. Program Menu

PROGRM MENU		
Parameter	**Choices**	**Description**
Level 2 submenus		
PWRUPM	**GO** DELAY	Power up mode. In GO mode, the indicator goes into operation immediately after a brief power up display test.

		In DELAY mode, the indicator performs a power up display test, and then enters a 60-second warm up period. If no motion is detected during the warm up period, the indicator becomes operational when the warm up period ends; if motion is detected, the delay timer is reset and the warm up period repeated.
RPNBAN	OFF 1D 2D 3D 5D **10D** 20D 50D	Reprint Zero Band. Specifies a band around gross zero in which the scale must pass in order to re-set the print function
SHUTDN	**NONE** 1MIN 2MIN 5MIN 10MIN	Function for automatic switch off if the instrument in not needed.
BAKLIT	OFF 15SEC **30SEC** 1MIN ON	Function for automatic switch off LCD back light if the instrument in not needed.
BUZZER	**OFF** ON	A sound of key press.
HOLDMD	DISABL **TOGGLE** AVERAG AUTO	Hold function *TOGGLE*: After press the HOLD key the weight will be frozen if no motion and bigger than zero. Press HOLD again, back to weighing mode. *AVERAG*: After press the HOLD key if bigger than zero and not increase weight, then start to take the average value in 3 seconds, the average weight will be frozen. Press HOLD again or after 2 minutes, back to weighing mode. *AUTO*: when no motion and bigger than zero, the weight will be frozen. Press HOLD again or after 2 minutes, back to weighing modus.
AVGTM	2SEC 3SEC **4SEC** 5SEC 6SEC 8SEC 12SEC 14SEC 16SEC	Timer for hold function to average raw data or time limited depend HOLDMD setting. See Hold function section in detail
HOLDTM	1MIN **2MIN** 3MIN 4MIN 5MIN 6MIN 8MIN 10MIN	Timer for hold function to limited the time of freeze. See Hold function section in detail
BMIJUD	OFF **ON**	BMI automatic judge function. BMI>18.5 LO not enough weight. 18.5□BMI>20.0 LO&OK slightly under weighed. 18.5□BMI>25.0 OK normal weight. 25.0□BMI>30.0 OK&HI slightly overweighed. 30.0□BMI HI overweighed
KYLOCK	**NONE** UNIT PRN HOLD BMI	Front Panel Key Lockout Option. In some applications it is desirable that the front panel keys cannot be accessed while operating in normal mode. NONE: no lock any keys. UNIT: UNITS keys (12) disable. PRN: PRINT keys (13) disable. HOLD: HOLD keys (7) disable.

	ZOTA UNPR BMUNPR ALL	BMI: BMI keys (11) disable. ZOTA: ZERO and TARE keys (8&9) disable. UNPR: UNITS and PRINT keys (12&13) disable. BMUNPR: BMI, UNITS and PRINT keys (11,12&13) disable. ALL: disable all. Note that this option only disables the front panel keys and does not lockout the functions that these keys perform. The zero, gross/net, tare, and print command are still accessible from the remote inputs on HDB14 of the *ADE-MAK*
CONSNU	**1** number	Consecutive numbering. Allows sequential numbering for print operations. The consecutive number value is incremented following each print operation.

Table 3-6. Program Menu Parameters

3.2.6. Print Format Menu

See Section 6.0 for information about custom print formatting.

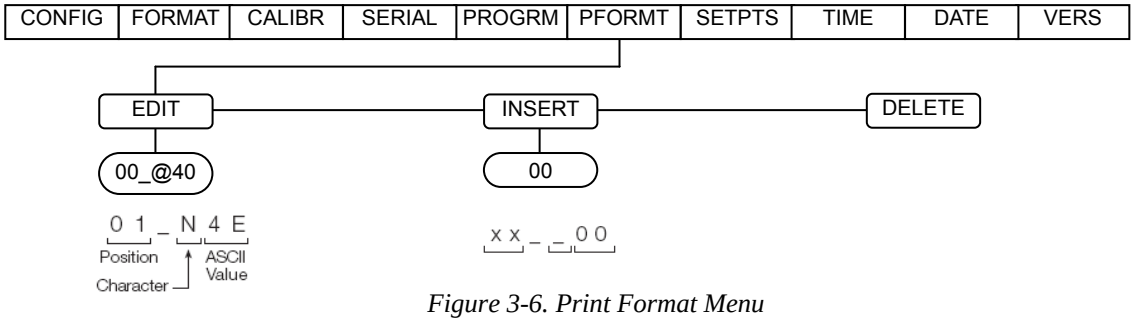


Figure 3-6. Print Format Menu

3.2.7. Set Points Menu

Also see Section 7.0 for detail logical diagram.

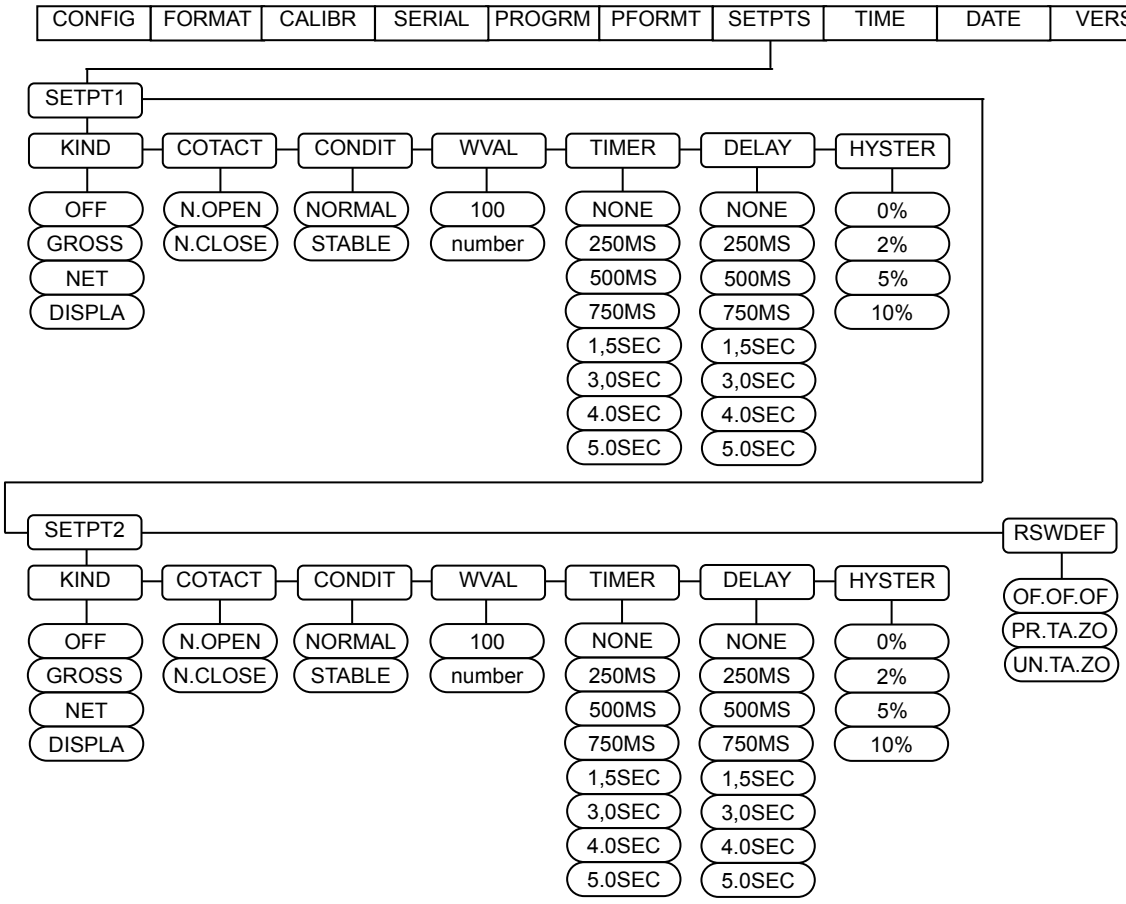


Figure 3-7 Set Points Menu

SETPTS MENU		
Parameter	**Choices**	**Description**
Level 2 submenus		
SETPT1	KIND CONTACT CONDIT WVAL TIMER DELAY HYSTER	Specifies settings for mode, contact type, stable, weight valve, timer, delay, and hysteresis used by the set point 1.
SETPT2	KIND CONTACT CONDIT WVAL TIMER DELAY HYSTER	Specifies settings for mode, contact type, stable, weight valve, timer, delay, and hysteresis used by the set point 2.
RSWDEF	**OF.OF.OF** PR.TA.ZO UN.TA.ZO	Specifies the function activated by remote switch inputs 1, 2 and 3. OF.OF.OF disable all remote switches PR.TA.ZO provides the same functions as the front panel keys. Remote switch 1 be ZERO key Remote switch 2 be TARE key Remote switch 3 be PRINT(ENTER) key UN.TA.ZO provides the same functions as the front panel keys. Remote switch 1 be ZERO key Remote switch 2 be TARE key Remote switch 3 be UNITS key
Level 3 submenus		SETPT1 ,SETPT2
KIND	**OFF** GROSS NET DISPLA ABSNET	Kinds of Operation mode, comparator source. OFF: Disable set points. GROSS: Source of Setpoint uses gross weight data. NET: Source of Setpoint uses net weight data. DISPLAY: Source of Setpoint uses display weight data. ABSNET: Source of Setpoint uses absolute value of net weight data.
CONTACT	N.OPEN **N.CLOSE**	Contact type, Contact status below the set point value, Output of comparator to be normal open or normal close.
CONDIT	**NORMAL** STABLE	Output enabled *only after* the weight reading has stabilized.
WVAL	**10** number	Set weight thresholds for set point. Output active if load over this weight.(load >=wval)
TIMER	**NONE** 250MS 500MS 750MS 1.5SEC 3.0SEC 4.0SEC 5.0SEC	The output is disabled after the time period has expired.
DELAY	**NONE** 250MS 500MS 750MS 1.5SEC 3.0SEC 4.0SEC 5.0SEC	Time delay before the output is enabled.
HYSTER	**0%** 2% 5% 10%	Set weight thresholds for setpoint. Output deactivate if load under this weight.(load<wval x hysteresis)

Table 3-7. Set Ponits Menu Parameters

3.2.8. Time Menu

The operator in panel mode can set time.

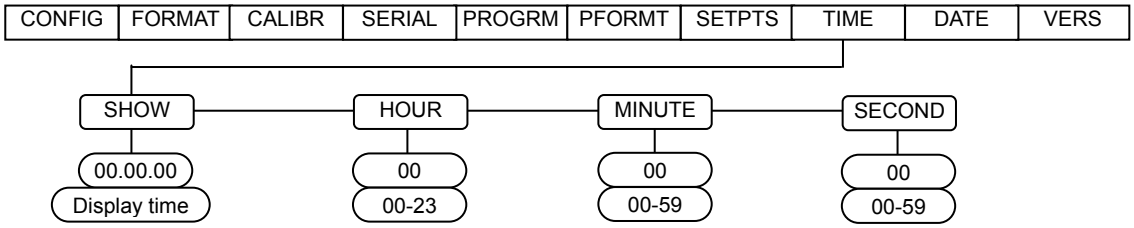


Figure 3-8. Time Menu

TIME MENU		
Parameter	**Choices**	**Description**
Level 2 submenus		
SHOW	HH.MM.SS	Display current time in HH.MM.SS format.
HOUR	hour (HH)	Set hour using 24-hour format.
MINUTE	minute (MM)	Set minute.
SECOND	second (SS)	Set second.

Table 3-8. Time Menu Parameters

3.2.9. Date Menu

The operator in panel mode can set date.

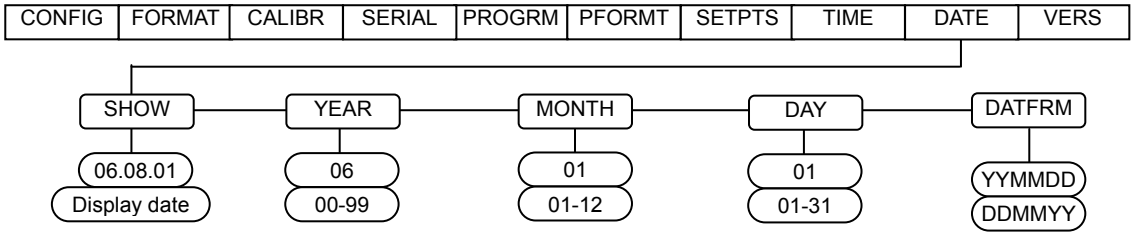


Figure 3-9.Date Menu

DATE MENU		
Parameter	**Choices**	**Description**
Level 2 submenus		
SHOW	YY.MM.DD	Display current date in YY.MM.DD or DD.MM.YY format.
YEAR	year (YY)	Set year (two digitals 00-99).
MONTH	month (MM)	Set month.
DAY	day (DD)	Set day.
DATFRM	**YYMMDD** DDMMYY	Specifies the date format. YYMMDD: Years, Month, Date, DDMMYY: Date, Month, Years

Table 3-9. Date Menu Parameters

3.2.10. Version Menu

The VERS menu is used to check the software version installed in the indicator. There are no parameters associated with the Version menu: when selected, the indicator displays the installed software version number.

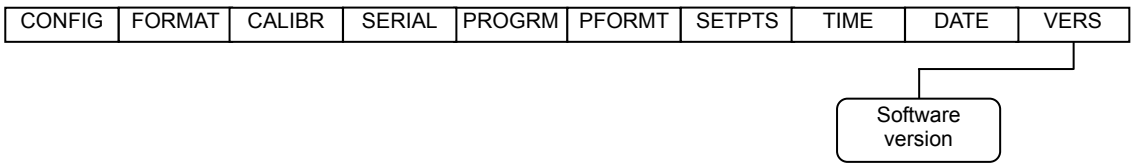


Figure 3-10. Version Menu

4. Calibration

The *ADE-MAK* can be calibrated using the front panel, or EDP commands. Each method consists of the following steps:

• Zero calibration

• Entering the test weight value

• Span calibration

• Optional rezero calibration for test weights using hooks or chains.

The following sections describe the calibration procedure for each of the calibration methods.

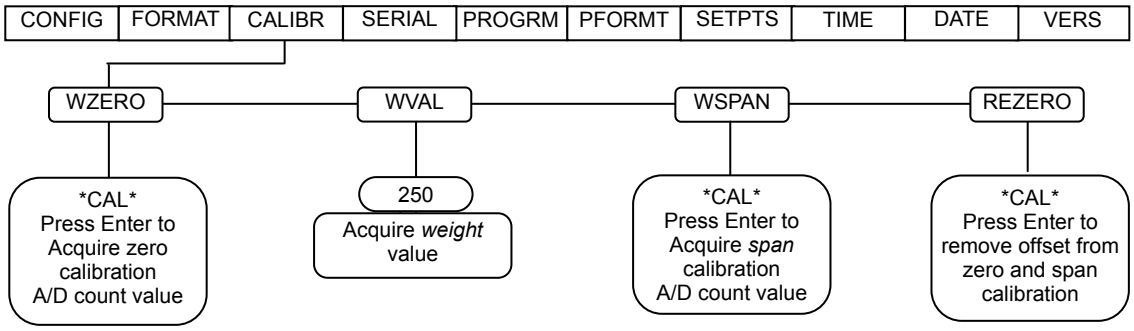


Figure 4-1. Calibration Menu

4.1. Front Panel Calibration

To calibrate the indicator using the front panel, do the following:

1. Place the indicator in configuration mode (display reads CONFIG) and remove all weight from the scale platform. If your test weights require hooks or chains, place the hooks or chains on the scale for zero calibration.
2. Press ⇨ until the display reads CALIBR (see Figure 4-1). Press ⇩ to go to zero calibration (WZERO).
3. With WZERO displayed, press ○ to calibrate zero. The indicator displays *CAL* while calibration is in progress then the display goes to (WVAL).
4. With WVAL displayed, place test weights on the scale and press ⇩ to show the test weight value. Use the procedure shown in Figure 4-2 to enter the actual test weight, then press ○ to save the value and go to span calibration (WSPAN).
5. With WSPAN displayed, press ○ to calibrate span. The indicator displays *CAL* while calibration is in progress, then the display goes to (REZERO).
6. The REZERO function is used to remove a calibration offset when hooks or chains are used to hang the test weights.

Note: *If no other apparatus was used to hang the test weights during calibration, remove the test weights and go to Step 7.*

• If hooks or chains were used during calibration, remove these and the test weights from the scale. With all weight removed, press ○ to rezero the scale. This function adjusts the zero and span calibration values. The indicator displays *CAL* while the zero and span calibrations are adjusted.

7. Press ⇧ until the display reads EXIT Y, then press ○ to exit configuration mode.

When editing numeric values, press ○ to allow numeric mode change entry, and then press CLEAR to change clear value.

Press number key (0~9) to entry the value.

Press ○ to save the value entered and return to the level above.

Figure 4-2. Editing Procedure for Numeri Values

4.2. EDP Command Calibration

To calibrate the indicator using EDP commands, the indicator EDP port must be connected to a terminal or personal computer. See Section 2.5 for EDP port pin assignments; see Section 5.0 for more information about using EDP commands.

Once the indicator is connected to the sending device, do the following:

1. Place the indicator in configuration mode (display reads CONFIG) and remove all weight from the scale platform. If your test weights require hooks or chains, place the hooks or chains on the scale for zero calibration.
2. Send the WZERO command to calibrate zero. The indicator displays *CAL* while calibration is in progress.

   NOTE: *During EDP command calibration, the *CAL* message remains on the display. The OK response is returned when calibration is complete.*
3. Place test weights on the scale and use the WVAL command to enter the test weight value in the following format:
   WVAL=nnnnnn<CR>
4. Send the WSPAN command to calibrate span. The indicator displays *CAL* while calibration is in progress.
5. To remove an offset value, clear all weight from the scale, including hooks or chains used to hang test weights, and then send the REZERO command. The indicator displays *CAL* while the zero and span calibrations are adjusted.

5. EDP Command

The *ADE-MAK* indicator can be controlled by a personal computer or remote keyboard connected to the indicator EDP port. Control is provided by a set of EDP commands that can simulate front panel key press functions, display and change setup parameters, and perform reporting functions. The EDP port provides the capability to print configuration data or to save that data to an attached personal computer.
This section describes the EDP command set and procedures for saving and transferring data using the EDP port.

5.1. The EDP Command Set

The EDP command set includes key press commands, mode commands, reporting commands, the default special function command, and parameter setting commands.
The indicator responds to most EDP commands by sending the message OK. The OK response verifies that the command was received and has been executed. (Pressing ENTER after processing a valid EDP command repeats the previous command.) If the command is unrecognized or cannot be executed, the indicator responds with ?.
The following sections list the commands and command syntax used for each of these groups.

5.1.1. Key Press Commands

Key press EDP commands (see Table 5-1) simulate pressing the front panel indicator keys. These commands can be used in both configuration and weighing mode.

COMMAND	Function
KZERO	In weighing mode, press the ZERO key
KGROSSNET	In weighing mode, press the GROSS/NET key
KTARE	In weighing mode, press the TARE key
KUNITS	In weighing mode, press the UNITS key
KPRIUNIT	Force to primary unit
KSECUNIT	Force to secandary unit
KPRINT	In weighing mode, press the PRINT key

Table 5-1. Key Press Command

5.1.2. Reporting Commands

Reporting commands (Table 5-2) send specific information to the EDP port. These commands can be used in both configuration mode and normal mode.

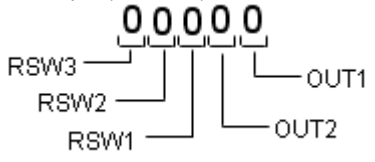
COMMAND	Function
DUMPALL	List all Parameters values.
VERSION	ADE-MAK Software version.
P	Current displayed weight with units Identifier Format: wwwwwww uu wwwwwww : the current displayed weight value &&&&&& (overload), :::::: (underrange) uu: the current displayed unit
ZZ	Current displayed weight with units Identifier and status. Format: swwwwwww uu zzz s: positive " ",nagative "-" wwwwwww : the current displayed weight value &&&&&& (overload), :::::: (underrange) uu: the current displayed unit zzz: the annunciator status value b2,b1,b0: 000: 0: kg on Annunciator 001: 1: lb on Annunciator 010: 2: g on Annunciator 011: 3: oz on Annunciator 100: 4: t on Annunciator b3: Spare b4:16: Hold on Annunciator b5:32: Net on Annunciator b6:64: Center of zero on Annunciator b7:128: Standstill on Annunciator For example, if the annunciator status value returned on the ZZ command is 161, the net, standstill, and kg annunciator are lit: 161represents the sum of the values for the standstill annunciator (128), net mode annunciator (32), and the kg units Annunciator(1).
BAT	Battery voltage and charging current.
ADS	A/D converter memory map.
EEx	EEPROM page x (x=0~3)
IO	List status of digital input (Remote Switch) and output (Set Point). 

Table 5-2. Reporting Command

5.1.3. Default Commands

The DEFAULT (reset configuration) command can be used to restore all configuration parameters to their default values. Before issuing this command, the indicator must be placed in test mode (press and hold setup switch for approximately three seconds to enter test mode).
This command is equivalent to using the DEFLT function on the TEST menu. See Section 8.8 for more information about test mode and using the TEST menu. NOTE: All load cell calibration settings are lost when the DEFAULT command is run.

5.1.4. Parameter Setting Commands

Parameter setting commands allow you to display or change the current value for a particular configuration parameter (Tables 5-3 through 5-9). Current configuration parameter settings can be displayed in either configuration mode or normal mode using the following syntax:

command<ENTER>

Most parameter values can be changed in configuration mode only. Use the following command syntax when changing parameter values:

command=value<ENTER>

Where *value* is a number or a parameter value. Use no spaces before or after the equal (=) sign. If you type an incorrect command or value, the display reads ??.

Changes to the parameters are saved as they are entered but typically do not take effect until you exit configuration mode.

For example, to set the motion band parameter to 5, type the following:

MOTBAND=5D<ENTER>

Command	Description	Values
GRADS	Graduations	1–100 000
ZTRKBND	Zero track band	OFF, 0.5D, 1D, 3D
ZRANGE	Zero range	1.9%, 100%
MOTBAND	Motion band	1D, 2D, 3D, 5D, 10D, 20D, 50D, OFF
OVRLOAD	Overload	FS+2%, FS+1D, FS+9D, FS
DIGFLTR1 DIGFLTR2 DIGFLTR3	Digital filtering	1, 2, 4, 8, 16, 32, 64, 128
DFSENS	Digital filter cutout sensitivity	2OUT, 4OUT, 8OUT, 16OUT, 32OUT, 64OUT, 128OUT
DFTHRH	Digital filter cutout threshold	NONE, 1DD, 2DD, 5DD, 10DD, 20DD, 50DD, 100DD, 200DD, 250DD
INIZR	Initial Zero Range	8%,20%,50%,100%,OFF

Table 5-3. CONFIG Commands

Command	Description	Values
PRI.DECPNT	Primary units decimal position	8.88888, 88.8888, 888.888, 8888.88, 88888.8, 888888
PRI.DSPDIV	Primary units display divisions	1D, 2D, 5D, 10D, 20D, 50D
PRI.UNITS	Primary units	LB, KG, OZ, G, T
SEC.DECPNT	Secondary units decimal position	8.88888, 88.8888, 888.888, 8888.88, 88888.8, 888888
SEC.DSPDIV	Secondary units display divisions	1D, 2D, 5D, 10D, 20D, 50D
SEC.UNITS	Secondary units	LB, KG, OZ, G, T
DSPRATE	Display rate	250MS, 500MS, 1SEC, 2SEC
HIRES	x10 resolution	OFF,ON
DATFRM	Date format	YYMMDD,DDMMYY

Table 5-4. FORMAT Commands

Command	Description	Values
WZERO	Zero calibration	-
WVAL	Test weight value	*test_weight_value*
WSPAN	Span calibration	-
REZERO	Rezero	-
LC.CD	Set deadload coefficient	*value*
LC.CW	Set span coefficient	*value*

Table 5-5. CALIBR Commands

Command	Description	Values
EDP.BAUD	EDP port baud rate	1200, 2400, 4800, 9600, 19200, 38400
EDP.BITS	EDP port data bits/parity	8NONE, 7EVEN, 7ODD, 7SPACE
EDP.TERMIN	EDP port termination character	CR/LF, CR
EDP.ADDRESS	EDP port RS-485 address	Value in hex (00~ffh)
EDP.ECHO	EDP port echo input	ON,OFF

PRN.BAUD	Printer port baud rate	1200, 2400, 4800, 9600
PRN.BITS	Printer port data bits/parity	8NONE, 7EVEN, 7ODD, 7SPACE
PRN.TERMIN	Printer port termination character	CR/LF, CR
PRN. LNGUGE	Ticket language	ENGLIS,GERMAN
STREAM	Streaming port	OFF, EDP, PRN
STMDLY	Stream output delay period	250ms,500ms, 1Sec, 2Sec,2Sec, 4Sec, 8Sec, 15Sec
PRNDEST	Print destination	PRN, EDP
PROTCT	Protection access from EDP	DISABLE, ENABLE

Table 5-6. SERIAL Commands

Command	Description	Values
PWRUPMD	Power up mode	GO, DELAY
SHUTDN	Power shunt down mode	NONE,1MIN,2MIN,5MIN,10MIN
BAKLIT	Back light of LCD	OFF,15SEC,30SEC,1MIN,ON
BUZZER	Sound of key press	OFF,ON
HOLDMD	Hold mode	DISABL, TOGGLE, AVERAG,AUTO
AVGTM	Average timer for hold function	2SEC,3SEC,4SEC,5SEC,6SEC,8SEC,12SEC,14SEC ,16SEC
HOLDTM	Hold timer for hold function	1MIN,2MIN,3MIN,4MIN,5MIN,6MIN,8MIN,10MIN
BMIJUD	Automatic judge BMI	OFF,ON
KYLOCK	Lock the keypad	NONE, UNIT, PRN,HOLD,BMI,ZOTA,UMPR,BMUNPR,ALL
REGULAT	Regulatory Compliance	USA, EUROPE, CANADA, NONE
CONSNU	Consecutive number	1 - 999999
DATE	Date	20yy/mm/dd
TIME	Time	hh:mm:ss
RPNBAND	Reprint Zero Band	1D, 2D, 3D, 5D, 10D, 20D, 50D, OFF

Table 5-7. PROGRM Commands

Command	Description	Values
WWPF	Print format strings in visible ASCII characters	See Section 6.0 for detailed information
WPF	Print format strings in ASCII Hex code	

Table 5-8. PFROMT Commands

Command	Description	Values
S1.KIND	Kinds of Operation mode for setpoint 1	OFF, GROSS, NET, DISPLA, ABSNET
S1.CONTACT	Contact status below the setpoint 1 value	N.CLOSE, N.OPEN
S1.CONDITI	Output enabled only after the weight reading has stabilized.	NORMAL, STABLE
S1.WAVL	Set weight thresholds for setpoint 1. Output 1 active if load over this weight.(load >=wval)	0 - 999999
S1.HYSTER	Set weight thresholds for setpoint 1. Output 1 deactive if load under this weight.(load<wval x hysteresis)	0%,2%,10%,5%
S1.TIMER	The output is disabled after the time period has expired.	None, 250ms,500ms, 750ms, 1.5Sec,3.0Sec, 4.0Sec, 5.0Sec
S1.DELAY	Time delay before the output is enabled.	None, 250ms,500ms, 750ms, 1.5Sec,3.0Sec, 4.0Sec, 5.0Sec
S2.KIND	Kinds of Operation mode for setpoint 2	OFF, GROSS, NET, DISPLA, ABSNET
S2.CONTACT	Contact status below the	N.CLOSE, N.OPEN

	setpoint 2 value	
S2.CONDITI	Output enabled only after the weight reading has stabilized.	NORMAL, STABLE
S2.WAVL	Set weight thresholds for setpoint 2. Output 2 active if load over this weight.(load >=wval)	0 - 999999
S2.HYSTER	Set weight thresholds for setpoint 2. Output 2 deactive if load under this weight.(load<wval x hysteresis)	0%,2%,10%,5%
S2.TIMER	The output is disabled after The time period has expired.	None, 250ms,500ms, 750ms, 1.5Sec,3.0Sec, 4.0Sec, 5.0Sec
S2.DELAY	Time delay before the output Is enabled.	None, 250ms,500ms, 750ms, 1.5Sec,3.0Sec, 4.0Sec, 5.0Sec

Table 5-9. SETPTS Commands

5.2. Saving and Transferring Data

Connecting a personal computer to the *ADE-MAK* EDP port allows you to save indicator configuration data to the PC or to download configuration data from the PC to an indicator. The following sections describe the procedures for these save and transfer operations.

5.2.1. Saving Indicator Data to a Personal Computer

Configuration data can be saved to a personal computer connected to the EDP port. The PC must be running a communications program such as HYPERTERMINAL®. See Section 2.5 for information about serial communications wiring and EDP port pin assignments.

When configuring the indicator, ensure that the values set for the BAUD and BITS parameters on the SERIAL menu match the baud rate, bits, and parity settings configured for the serial port on the PC.

To save all configuration data, place the indicator in configuration mode and send the DUMPALL EDP command to the indicator. The *ADE-MAK* responds by sending all configuration parameters to the PC as ASCII-formatted text.

5.2.2. Download Configuration Data from Personal Computer to Indicator

Configuration data saved on a PC or floppy disk can be downloaded from the PC to an indicator. This procedure is useful when a number of indicators with similar configurations are set up or when an indicator is replaced.

To download configuration data, connect the PC to the EDP port as described in Section 5.2. Place the indicator in configuration mode and use the PC communications software to send the saved configuration data to the indicator. When transfer is complete, calibrate the indicator as described in Section 4.0.

NOTES:

- Calibration settings are included in the configuration data downloaded to the indicator. If the receiving indicator is a direct replacement for another *ADE-MAK* and the attached scale is not changed, recalibration is not required.
- When downloading configurations that include changed serial communications settings, edit the data file to place the serial communications changes at the end of the file. Communication between the PC and indicator will be lost once the indicator receives settings for baud rate (BAUD parameter) or data bits and parity (BITS parameter) that do not match those configured for the PC.

The *ADE-MAK* print format can be edited to specify the format of the printed output when the PRINT key is pressed or when a KPRINT EDP command is received.

Each print format can be customized to include up to 500 characters of information, such as company name and address, on printed tickets. You can use the indicator front panel (PFORMT menu), or EDP commands to customize the print format.

6.1. Print Formatting Command

Table 6-1 lists commands you can use to format the print format. Text included in the format string must be enclosed in quotation marks (hex 22). Text characters can include any ASCII character that can be printed by the output device.

COMMAND	Function
@G	Gross weight in displayed units
@T	Tare weight in displayed units
@N	Net weight in displayed units
@C	Consecutive number
@Ln	New line, n specifies number of termination
@t	Time
@d	Date
@Sn	Space, n specifies number of space
@M	Conditional net and tare weights. Use the @M command in pairs to enclose the @N and @T commands. If no tare is in the system, net and tare weights are not printed.
@H	User Height
@B	User BMI

Table 6-1. Print Format Command

The default *ADE-MAK* print format is shown below:
@G <CR> @M @T <CR> @N @M <CR>@H <CR>@B <CR>@t @d <CR>

NOTE: The 500-character limit of the print format string includes the output field length of the print formatting commands, not the command length. For example, if the indicator is configured to show a decimal point, the @G command generates an output field of 13 characters: the 10-character weight value (including decimal point), one space, and a two-digit units identifier.

6.2. Customizing Print Formats

The following sections describe procedures for customizing the print format using the EDP port or the front panel (PFORMT menu).

6.2.1. Using the EDP Port

With a personal computer, terminal, or remote keyboard attached to the *ADE-MAK* EDP port, you can use the EDP command set to customize the print format string.

To view the current setting of the print format, type WWPF (to enter ASCII text) or WPF (to enter hex values) then press ENTER. The indicator responds by sending the current configuration for the print format:

Use the WWPF or WPF EDP command followed by an equals sign (=) and zero (0) to edit the print format string.

The following example shows the commands used to define a print format string for an Eltron LP-2742 printer.

NOTE: *The N, AxxxxxxN, Bx, and P1 commands used in the example are Eltron printer-specific commands*

.

Example (using visible ASCII characters)

```
Wwpf = 0
N
A0,0,0,3,1,2,N,"Vishay  @d @t @C"
A8,50,0,5,1,1,N,"@G"
@MA8,120,0,5,1,1,N,"@T"
A8,190,0,5,1,1,N,"@N"@M
B8,260,0,3,3,7,100,B,"@G"
P1
```

Example (using Hex format)

```
wpf=0
4E 0D 41 30 2C 30 2C 30 2C 33 2C 31 2C 32 2C 4E
2C 22 43 65 6C 74 72 6F 6E 20 54 65 63 68 6E 6F
6C 6F 67 69 65 73 20 49 6E 63 2E 20 40 64 20 40
74 20 40 43 22 0D 41 38 2C 35 30 2C 30 2C 35 2C
31 2C 31 2C 4E 2C 22 40 47 22 0D 40 4D 41 38 2C
31 32 30 2C 30 2C 35 2C 31 2C 31 2C 4E 2C 22 40
54 22 0D 41 38 2C 31 39 30 2C 30 2C 35 2C 31 2C
31 2C 4E 2C 22 40 4E 22 40 4D 0D 42 38 2C 32 36
30 2C 30 2C 33 2C 33 2C 37 2C 31 30 30 2C 42 2C
22 40 47 22 0D 50 31 0D
```

NOTE: *After entering the WWPF=0 or WPF=0 command, you must begin entering the print format. If no data is entered, the command times out, resulting in a blank format.*

6.2.2. Using the Front Panel

If you have no access to equipment for communication through the EDP port or are working at a site where

such equipment cannot be used, you can use the PFORMT menu (see Figure 6-1) to customize the print format. Using the PFORMT menu, you can edit the print format string by changing the hex values of the ASCII characters in the format string.

To edit a print format, do the following:

1. In setup mode, use the navigation keys to go to the PFORMT menu. Press ⇩ to show the EDIT submenu.
2. Press ⇩ again to show the print format string. Use the ⇦ and ⇨ keys to scroll through the format. The number position of each character is shown in the two digits at the left of the display, hex 00–BF.
3. To **edit** a character, press ○ while the character is displayed. The rightmost digit flashes, indicating that it can be changed. Use the ⇧ and ⇩ keys to increment or decrement the value, or use the ⇦ key to move to the next digit. Press ○ to save any changes and advance to the next character in the string.
4. If done, press ⇧ to return to the EDIT submenu.
5. To **insert** one or more characters, display the character position *after* which characters are to be inserted. Press ⇧ to return to the EDIT submenu, and then press ⇨ to show the INSERT parameter. Press ○ to insert one character; repeat presses to add more characters. Each press of the ○ key adds a character at the location last shown under EDIT submenu and shifts all subsequent characters to the right. Inserted characters are assigned hex value 00 (null). To edit inserted characters, return to the EDIT submenu and make changes as described under step 3.
6. To **delete** one or more characters, display the character to be deleted. Press ⇧ to return to the EDIT submenu, and then press ⇨ twice to show the DELETE parameter. Press ○ to delete one character; repeat presses to delete more characters. Each press of the ○ key deletes a character, starting at the location last shown under EDIT submenu, and then moving left to preceding characters. Each deletion shifts all subsequent characters to the left.

NOTE: Some characters cannot be displayed on the *ADE-MAK* front panel (see the ASCII character chart on Section 8.4.) and are shown as blanks. The *ADE-MAK* can send or receive any ASCII character; the character printed depends on the particular ASCII character set implemented for the receiving device.

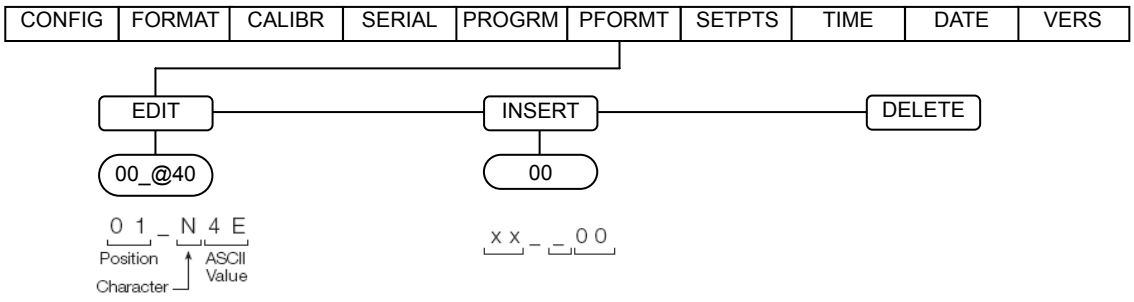
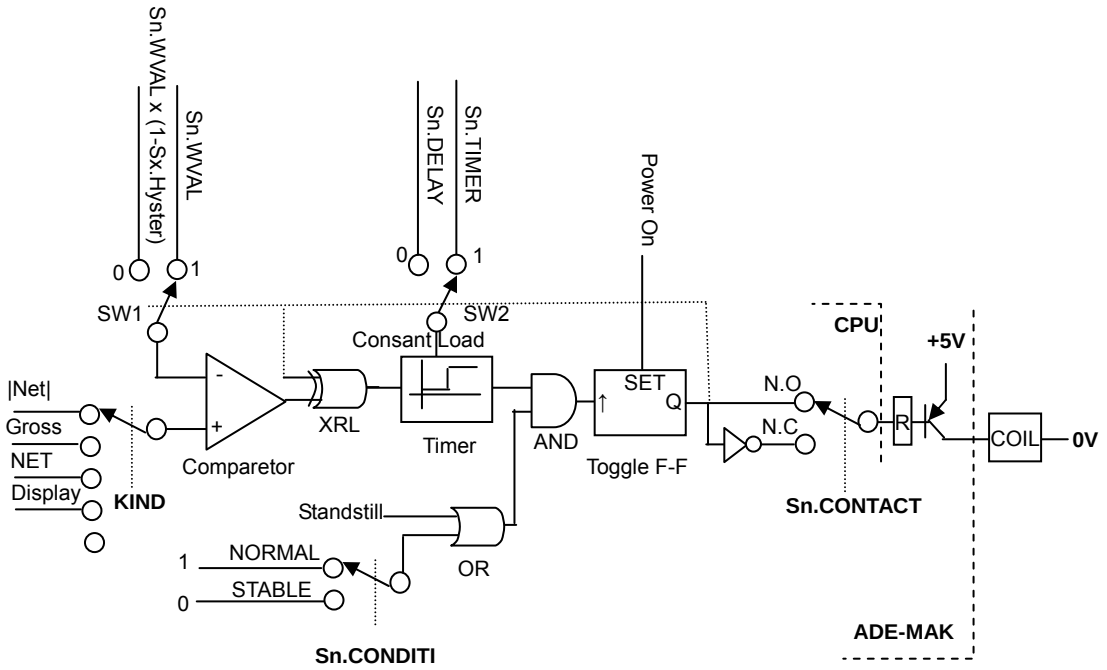


Figure 6-1. PFORMT Menu, Showing Alphanumeric Character Entry Procedure

7. Set Ponits



1. Power on the Toggle Flip-Flop Q =1, The CPU output may high or low depend on Sn.CONTACT select. Also the XRL gate became a inverter.
2. Joint XRL gate and comparator behavior will as:
   If load (may be gross or display weight depend on KIND select) bigger than Sn.WAVL, the output of XRL gate is high, otherwise is low.
3. The timer will counting if the load is continuing bigger than Sn.WVAL.
   If not, the timer will load from SW2 (now is load from Sn.TIMER).
4. The Output of AND gate will high, if output of OR gate is high. (Depend on Sn.CONDITI select). Otherwise wait until Standstill is high. (If Sn.CONDITI = STABLE).
5. Output (Q) of the Toggle F-F changed from 1 to 0.and The COIL also changed State. (NO to NC, or NC to NO) and SW1 & SW2 switchover other side, respective changed Comparator BASE and Timer constant.

8. Appendix

8.1. Error Messages

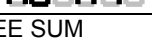
Error Message	Description	Solution
	Overload	Weight value exceeds scale capacity
	Display overflow (negative)	Negative weight value too large to be displayed (< –99999)
	Display overflow (positive)	Positive weight value too large to be displayed (> 999999)
AD LOW	A/D over negative range	Check scale for binding or damage.
AD HI	A/D over positive range	Check scale for binding or damage.
EE SUM 	Parameter or calibration checksum error	Recalibration, Call Vishay service.
EE WR	EEPROM write error	Call Vishay service.
PM SUM	Internal program checksum error	Call Vishay service.
HOFSET	Load > calibrated zero +capacity x INIZR, while power on.	Check weight and INIZR
LOFSET	Load < calibrated zero + capacity x INIZR, while power on.	Check weight and INIZR
UOFSET	Un Stable within 2 sec, while power on.	Check weight and INIZR

Table 8-1.ADE-MAK Error Messages

8.2. Continuous Output (Stream) Format

Figure 8-1 shows the continuous output format sent to the *ADE-MAK* EDP or printer port when the STREAM parameter (SERIAL menu) is set to either EDP or PRN.

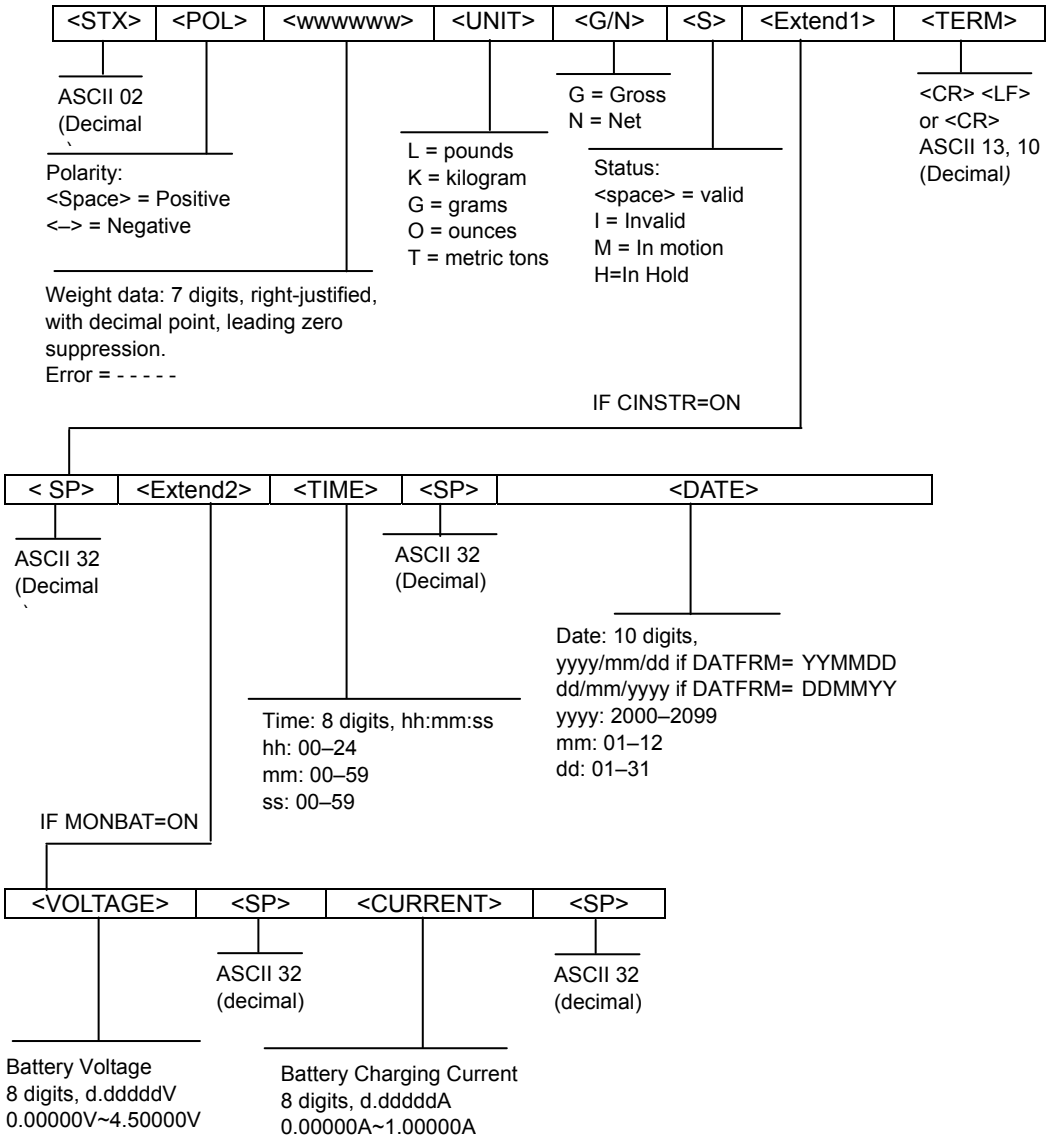


Figure 8-1. Continuous Output Data Fromat

8.3. Front Panel Display Characters

Figure 8-2 shows the 7-segment LCD character set used to display alphanumeric characters on the *ADE-MAK* front panel.

	-	9	E	Q
	.	:	F	R
	/	;	G	S
	0	<	H	T
%	1	=	I	U
&	2	>	J	V
'	3	?	K	W
(	4	@	L	X
)	5	A	M	Y
*	6	B	N	Z
+	7	C	O	[
,	8	D	P	\

Figure 8-2. ADE-MAK Display Characters

8.4. ASCII Character Chart

Use the decimal values for ASCII characters listed in Tables 8-2 and 8-3 when specifying print format strings on the *ADE-MAK* PFORMT menus. The actual character printed depends on the character mapping used by the output device.

The *ADE-MAK* can send or receive any ASCII character value (decimal 0–255), but the indicator display is limited to numbers, upper-case, unaccented letters, and a few special characters.

Control	ASCII	Dec	Hex	ASCII	Dec	Hex	ASCII	Dec	Hex	ASCII	Dec	Hex
Ctrl-@	NUL	00	00	space	32	20	@	64	40	`	96	60
Ctrl-A	SOH	01	01	!	33	21	A	65	41	a	97	61
Ctrl-B	STX	02	02	"	34	22	B	66	42	b	98	62
Ctrl-C	ETX	03	03	#	35	23	C	67	43	c	99	63
Ctrl-D	EOT	04	04	$	36	24	D	68	44	d	100	64
Ctrl-E	ENQ	05	05	%	37	25	E	69	45	e	101	65
Ctrl-F	ACK	06	06	&	38	26	F	70	46	f	102	66
Ctrl-G	BEL	07	07	'	39	27	G	71	47	g	103	67
Ctrl-H	BS	08	08	(	40	28	H	72	48	h	104	68
Ctrl-I	HT	09	09	)	41	29	I	73	49	i	105	69
Ctrl-J	LF	10	0A	*	42	2A	J	74	4A	j	106	6A
Ctrl-K	VT	11	0B	+	43	2B	K	75	4B	k	107	6B
Ctrl-L	FF	12	0C	,	44	2C	L	76	4C	l	108	6C
Ctrl-M	CR	13	0D	-	45	2D	M	77	4D	m	109	6D
Ctrl-N	SO	14	0E	.	46	2E	N	78	4E	n	110	6E
Ctrl-O	SI	15	0F	/	47	2F	O	79	4F	o	111	6F
Ctrl-P	DLE	16	10	0	48	30	P	80	50	p	112	70
Ctrl-Q	DC1	17	11	1	49	31	Q	81	51	q	113	71
Ctrl-R	DC2	18	12	2	50	32	R	82	52	r	114	72
Ctrl-S	DC3	19	13	3	51	33	S	83	53	s	115	73
Ctrl-T	DC4	20	14	4	52	34	T	84	54	t	116	74
Ctrl-U	NAK	21	15	5	53	35	U	85	55	u	117	75
Ctrl-V	SYN	22	16	6	54	36	V	86	56	v	118	76
Ctrl-W	ETB	23	17	7	55	37	W	87	57	w	119	77
Ctrl-X	CAN	24	18	8	56	38	X	88	58	x	120	78
Ctrl-Y	EM	25	19	9	57	39	Y	89	59	y	121	79
Ctrl-Z	SUB	26	1A	:	58	3A	Z	90	5A	z	122	7A
Ctrl-[	ESC	27	1B	;	59	3B	[	91	5B	{	123	7B
Ctrl-\	FS	28	1C	<	60	3C	\	92	5C	|	124	7C
Ctrl-]	GS	29	1D	=	61	3D	]	93	5D	}	125	7D
Ctrl-^	RS	30	1E	>	62	3E	^	94	5E	~	126	7E
Ctrl-_	US	31	1F	?	63	3F	_	95	5F	DEL	127	7F

Table 8-2. ASCII Character Chart (Part I)

ASCII	Dec	Hex	ASCII	Dec	Hex	ASCII	Dec	Hex	ASCII	Dec	Hex
Ç	128	80	á	160	A0		192	C0	α	224	E0
ü	129	81	í	161	A1		193	C1	β	225	E1
é	130	82	ó	162	A2		194	C2	Γ	226	E2
â	131	83	ú	163	A3		195	C3	π	227	E3
ä	132	84	ñ	164	A4		196	C4	Σ	228	E4
à	133	85	Ñ	165	A5		197	C5	σ	229	E5
å	134	86	ª	166	A6		198	C6	µ	230	E6
ç	135	87	º	167	A7		199	C7	τ	231	E7
ê	136	88	¿	168	A8		200	C8	Φ	232	E8
ë	137	89		169	A9		201	C9	Θ	233	E9
è	138	8A	¬	170	AA		202	CA	Ω	234	EA
ï	139	8B	1/2	171	AB		203	CB	δ	235	EB
î	140	8C	1/4	172	AC		204	CC	∞	236	EC
ì	141	8D	¡	173	AD		205	CD	φ	237	ED
Ä	142	8E	«	174	AE		206	CE	∈	238	EE
Å	143	8F	»	175	AF		207	CF	∩	239	EF
É	144	90		176	B0		208	D0	≡	240	F0
æ	145	91		177	B1		209	D1	±	241	F1
Æ	146	92		178	B2		210	D2	≥	242	F2
ô	147	93		179	B3		211	D3	≤	243	F3
ö	148	94		180	B4		212	D4	⌠	244	F4
ò	149	95		181	B5		213	D5	⌡	245	F5
û	150	96		182	B6		214	D6	÷	246	F6
ù	151	97		183	B7		215	D7	≈	247	F7
ÿ	152	98		184	B8		216	D8	°	248	F8
Ö	153	99		185	B9		217	D9	•	249	F9
Ü	154	9A		186	BA		218	DA		250	FA
¢	155	9B		187	BB		219	DB		251	FB
£	156	9C		188	BC		220	DC		252	FC
¥	157	9D		189	BD		221	DD	²	253	FD
Pts	158	9E		190	BE		222	DE		254	FE
ƒ	159	9F		191	BF		223	DF		255	FF

Table 8-3. ASCII Character Chart (Part 2)

8.5. Calibration Examples

The *ADE-MAK* has the capability to automatically convert a weight into many different types of units and instantly display those results with a press of the **UNITS** key. (Or KUNIT, KPRIUNIT, KSECUNIT)
Press the **UNITS** key to switch between primary and secondary units.

Note:

1.) The primary unit is for calibration and power on default.
2.) After Calibration, any changed of PRI.DSPDIV, PRI.DECPNT, GRADS, WVAL will affect the results.

For example: primary unit : 600 ± 0.2 lb ,secondary unit : ± 0.1 kg

Then setting

PRI.DSPDIV=2D
PRI.DECPNT=88888.8 (0.2lb=2/0.1)
GRADS=3000 (600lb / 0.2lb = 3, 000, Capacity=GRADS* *Min.Weight* =600lb)
PRI.UNITS=LB
SEC.DSPDIV=1D
SEC.DECPNT=88888.8 (0.1kg=1/0.1)
SEC.UNITS=KG

Calibration

WZERO (Empty scale)
WVAL=300 (If you have 300 lb standard load)
WSPAN (Put 300 lb on scale)

EDP Operation

ZZ (show:”xxxxx.2LB”, where 2 may be 0/2/4/6/8)
KUNITS (show:”OK”, toggle units, now to secondary unit)
ZZ (show:”xxxxx.1KG”, where 1 may be 0~9)
KPRIUNIT (show:”OK”, force to primary secondary unit)
ZZ (show:”xxxxx.2LB”, where 2 may be 0/2/4/6/8)

For example: primary unit : 500 ± 0.2 kg ,secondary unit : ± 0.5 lb

Then setting

PRI.DSPDIV=2D
PRI.DECPNT=88888.8 (0.2kg=2/0.1)
GRADS=2500 (500kg / 0.2kg = 2, 500, Capacity=GRADS* *Min.Weight* =500kg)
PRI.UNITS=KG
SEC.DSPDIV=5D
SEC.DECPNT=88888.8 (0.5kg=5/0.1)
SEC.UNITS=LB

Calibration

WZERO (Zero load)

WVAL=500	(If you have 500kg standard load)
WSPAN	(Put 500kg on scale)
EDP Operation	
ZZ	(show:”xxxxx.2KG”, where 2 may be 0/2/4/6/8)
KSECUNIT	(show:”OK”, force to secondary unit)
ZZ	(show:”xxxxx.5LB”, where 1 may be 0/5)
KPRIUNIT	(show:”OK”, force to primary secondary unit)
ZZ	(show:”xxxxx.2KG”, where 2 may be 0/2/4/6/8)

8.6. Units Covert Table

Internal program of *ADE-MAK* Convert primary to/from secondary units used following table as factors.

Conversion Factors

Primary Unit	*x Multiplier or / divisor*	Secondary Unit
kg	*x* 2.20462262184878	lb
kg	*x* 1000	g
kg	*x* 35.2739619495804	oz
kg	/ 1000	t
lb	/ 2.20462262184878	kg
lb	*x* 453.59237	g
lb	*x* 16	oz
lb	/ 2204.62	t
g	/ 1000	kg
g	/ 453.59237	lb
g	*x* 0.00228571428571429	oz
g	/ 1000000	t
oz	/ 35.2739619495804	kg
oz	/ 16	lb
oz	/ 0.00228571428571429	g
oz	/ 35273.9619495804	t
t	* 1000	kg
t	* 2204.62262184878	lb
t	* 1000000	g
t	* 35273.9619495804	oz

Table 8-4. Units Conversion Factors

8.7. Digital Filtering

The *ADE-MAK* uses averaged digital filtering to reduce the effect of vibration on weight readings. Adjustable threshold and sensitivity functions allow quick settling by suspending filter averaging, allowing the weight reading to jump to the new value. Digital filtering parameters are set using the CONFIG menu.

8.7.1. DIGFLTRx Parameters

The first three digital filtering parameters, DIGFL1, DIGFL2, and DIGFL3, are configurable filter stages that control the effect of a single A/D reading on the displayed weight. The value assigned to each parameter sets the number of readings received from the preceding filter stage before averaging.

The overall filtering effect can be expressed by adding the values assigned to the three filter stages:

DIGFL1 + DIGFL2 + DIGFL3

For example, if the filters are configured as DIGFL1=4, DIGFL2=8, DIGFL3=8, the overall filtering effect is 20 (4 + 8 + 8). With this configuration, each A/D reading has a 1-in-20 effect on the displayed weight value. Setting the filters to 1 effectively disables digital filtering.

8.7.2. DFSENS and DFTHRH Parameters

The three digital filters can be used by themselves to eliminate vibration effects, but heavy filtering also increases settling time. The DFSENS (digital filter sensitivity) and DFTHRH (digital filter threshold) parameters can be used to temporarily override filter averaging and improve settling time:

- DFSENS specifies the number of consecutive scale readings that must fall outside the filter threshold (DFTHRH) before digital filtering is suspended.
- DFTHRH sets a threshold value, in display divisions. When a specified number of consecutive scale readings (DFSENS) fall outside of this threshold, digital filtering is suspended. Set DFTHRH to NONE to turn off the filter override.

8.7.3. Setting the Digital Filters Parameters

Fine-tuning the digital filter parameters greatly improves indicator performance in heavy-vibration environments. Use the following procedure to determine vibration effects on the scale and optimize the digital filtering configuration.

1. In setup mode, set all three digital filters (DIGFL1, DIGFL2, DIGFL3) to 1. Set DFTHRH to NONE. Return indicator to normal mode.
2. Remove all weight from the scale, then watch the indicator display to determine the magnitude of vibration effects on the scale. Record the weight below which all but a few readings fall. This value is used to calculate the DFTHRH parameter value in Step 4. For example, if a high-capacity scale produces vibration-related readings of up to 50 lb, with occasional spikes to 75 lb, record 50 lb as the threshold weight value.
3. Place the indicator in setup mode and set the digital filters (DIGFL*x*) to eliminate the vibration effects on the scale. (Leave DFTHRH set to NONE.) Reconfigure as necessary to find the lowest effective values for the DIGFL*x* parameters.
4. With optimum values assigned to the DIGFL*x* parameters, calculate the DFTHRH parameter value by converting the weight value recorded in Step 2 to display divisions:

   threshold_weight_value / DSPDIV

   In the example in Step 2, with a threshold weight value of 50 lb and a display division value of 5lb: *50 / 5lb = 10DD.* DFTHRH should be set to 10DD for this example.
5. Finally, set the DFSENS parameter high enough to ignore transient peaks. Longer transients (typically caused by lower vibration frequencies) will cause more consecutive out-of-band readings, so DFSENS should be set higher to counter low frequency transients. Reconfigure as necessary to find the lowest effective value for the DFSENS parameter.

8.8. Test Mode

In addition to normal and setup modes, test mode provides a number of diagnostic functions for the *ADE-MAK*, including:

- Display raw A/D count
- LCD test
- Digital input and output monitor
- Battery voltage monitor
- Batter charging current monitor
- Display digital filter raw counts
- Reset configuration parameters to default values
- Transmit test character (“U”) from serial port
- Display characters received by serial port

To enter test mode, press and hold the setup switch. After about three seconds, the test mode display automatically shifts to the first test menu function, *A/DTST*.

Figure 8-3 shows the Test Menu structure. Note that, because the Test Menu functions are all on a single menu level, Press the ○ key to execution the function.

Press the ⇧ key to exit test mode.

Table 8-5 summarizes the test menu functions.

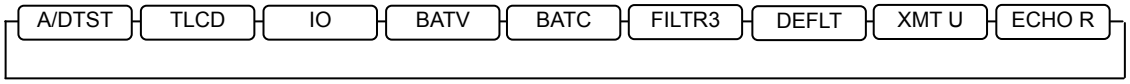


Figure 8-3. Test Menu

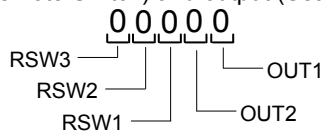
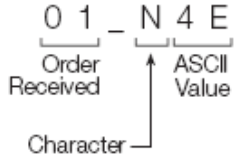
TEST Menu	
Function	Description
A/DTST	Display raw count from A/D converter.
TLCD	Lit on all LCD segment for test LCD.
IO	Display digital input (Remote Switch) and output (Set Point) status 
BATV	Display battery voltage in V
BATC	Display battery charging current in A
FILTR3	Display filtered raw count for digital filters 3
DEFLT	Default parameters Press setup switch and Enter key at the same time to reset configuration and calibration parameters to factory default values. Load cells must be recalibrated before using the indicator (see Section 5.1.3.).
XMT U	Transmit “U” Press and hold Enter key to send ASCII “U” characters (decimal 85) from the serial port.
ECHO R	Echo received characters When Ready is displayed, press the Enter key to view characters received at serial port. The first two digits show the order of the character received (see diagram). 

Table 8-5. Test Menu Function

8.9. Tare, Zero key and REGULAT parameter

The function of the TARE and ZERO keys depends on the value specified for the REGULAT parameter. Table below describes the function of these keys for each of the regulatory modes.

REGULAT Parameter Value	Weight on Scale	Tare in System	Key Press Function	
			KTARE	KZERO
USA	zero or negative	no	no active	ZERO
		yes	CLEAR TARE	
	positive	no	TARE	
		yes	TARE	
CANADA	zero or negative	no	no active	ZERO
		yes	CLEAR TARE	
	positive	no	TARE	
		yes	no active	
EUROPE	zero or negative	no	no active	ZERO
		yes	CLEAR TARE	ZERO and CLEAR TARE
	positive	no	TARE	ZERO
		yes	TARE	ZERO *and* CLEAR TARE
NONE	zero or negative	no	TARE	ZERO
		yes	CLEAR TARE	
	positive	no	TARE	
		yes	CLEAR TARE	

Note:

b.) ZERO if must be in Standstill.

c.) ZERO if Weight is within ZRANGE. *No action* if weight is outside of ZRANGE

d.) CLEAR TARE or ZERO force indicators goes into gross mode.

e.) TARE force indicator goes into net mode.

8.10. Hold Function

Hold Function:

With the hold weighing function, it is possible to weigh restless weighing samples such as live animals, moving objects, liquids. The instrument provides special mode settings to accommodate sample's movements.

Base operation of HOLD key:

Toggle Hold Mode: implements a manual Hold function.

To perform the Toggle Hold function does the following:

The weighing sample must be heavier than zero 'dead' band.

1. Press the <**HOLD**> key once, the instrument wait stable signal then hold the current displayed weight with the symbol <**HOLD**>. During waiting stable current weight appear and the symbol <**HOLD**> flash.If the weight readings remain unstable for longer than **AVGTM** seconds, the operation is cancelled and the <**ER STB**> message is displayed.
2. Press the manual <**HOLD**> key again to return the display to normal weighing. Or wait until **HOLDTM** minute.

Average Hold Mode: The <**HOLD**> key is used to enable live weight averaging. With this feature, it is possible

To determine the weight of a continually moving mass (e.g. livestock).

The weighing sample must be heavier than zero 'dead' band.

1. Place the weighing sample on the scale and wait until it has stabilized.
2. Press the <**HOLD**> key to start dynamic weighing. During dynamic weighing, current average weight appear in the display, and the dynamic result is then displayed with the symbol <**HOLD**>. The scale calculates the mean value from a hundred weighing operations within **AVGTM** seconds.
3. Press the <**HOLD**> again to back to weighing mode (symbol <**HOLD**> will off).or wait until **HOLDTM** minute.

Note: When first <**HOLD**> key press, program don't wait stable signal,

It is possible to press the <**HOLD**> key at the beginning. Then place weighing sample on the scale and wait until it has stabilized (via setting **MOTBAND**). Start dynamic weighing. During dynamic weighing, current average weight appear in the display and the <**HOLD**> annunciator flashes. The scale calculates the mean value from a hundred weighing operations within **AVGTM** seconds. The dynamic result is then displayed with the symbol <**HOLD**>.

Auto Hold Mode: When the AUTO function is set ON, different subjects can be weighed one after another without pressing any buttons. When the Indicator displays < **READY** > message, simply place subject on pan.

In Auto mode the following sequence is followed:

1. While the net weight is within the zero 'dead' band, the instrument shows the current weight.
2. Press the <**TARE**> or <**ZERO**> key to clear any residual weight and return the scale to the zero state.
3. Press the < **HOLD** > key to entry auto hold mode. The display show current weight and

<**READY**>Message in alternately and Flash <**HOLD**> symbol ,if the weight inside the zero 'dead' band.

4. Place the mass to be weighed on the scale.
5. Once the weight moves outside the zero 'dead' band and stable signal, the instrument begins to calculate a long term average (selectable time, **AVGTM**) that compensates for any movement in the mass. During the selectable time the signal must be stable, if not, time starts again.The instrument flashes the <**HOLD**> symbol and shows the current average value.
6. The <**HOLD**> symbol is steady when the final sample weight is shown on the display.
7. Press the < **HOLD** > key to force the sample to be re-calculated. Press any other key to back to weighing Mode.
8. Once the weight is returned to the zero 'dead' band, the cycle can be repeated without press any key.

* zero 'dead' band define is 5 Min.weights.(5 DD or 5 scale divisions)

8.11. Specification

Power

Wall Adapter:

Line Voltage	115 or 230VAC
Frequency	50 or 60HZ
Power Consumption	11W in-charger, 2W off-charger

Main Circuit:

Input Voltage	5.0VDC
Max. Current(in-charger)	1000mA

Battery Requirement:	Rechargeable Lithium Ion Cylindrical (18650x2) Cell 3.7V 4000mAH

Battery Operation:

Charger	7~10 Hours
Full Active (350ohm, Backlight-ON)	63 Hours
Full Active (87.5ohm, Backlight-ON)	46 Hours
Saving (350ohm, Backlight-ON 30Sec, Shutdown 5Min)	200Hours

Analog Specifications

Full Scale Input Signal Up to	18.5 mV
Excitation Voltage	5 ± 0.3 VDC, 4 x 350Ω or 8 x 700Ω load cells
Sense Amplifier	Differential amplifier with 4- and 6-wire sensing
Analog Signal	Sensitivity 0.15 μV/graduation minimum, 1.0 μV/grad recommended
Input Impedance	10^{11} Ω, typical
Noise (ref to input)	0.3 μV p-p with digital filters at 4-4-4
Internal Resolution	1 6770 000 counts
Display Resolution	999 999 dd
Measurement Rate	15 measurements/sec
Input Sensitivity	0.6 nV per internal count
System Linearity Within	0.01% of full scale
Zero Stability	150 nV/°C, maximum
Span Stability	3.5 ppm/°C, maximum
Calibration Method	Software, constants stored in EEPROM
Common Mode Voltage	+1.5 to +3.5 V, referred to zero voltage
Common Mode Rejection	130 dB minimum @ 50 or 60 Hz
Normal Mode Rejection	90 dB minimum @ 50 or 60 Hz
RFI Protection	Signal, excitation, and sense lines protected by Capacitor bypass

Digital Specifications

Microcomputer	AT89C51RD2 with 64K EEPROM @ 18.432 MHz
Digital Inputs (Option)	3 inputs, TTL or switch closure, active-low
Setpoint Control Outputs (Option)	2 Outputs, Photo Relay Single Pole, Normal Open, max output current 1A.
Digital Filters	3 filters, software selectable

Serial Communications

EDP Port	Full duplex RS-232 38400,19200,9600, 4800, 2400, 1200 bps
Printer Port	Output-only RS-232 or active 20 mA current loop, 9600, 4800, 2400, 1200 bps
Both Ports	7 or 8 data bits; even, odd, or no parity

Operator Interface

Display	6-digit LCD display. 7-segment, 0.815 in (21.2 mm) digits
LCD annunciator	net, center of zero, standstill, kg/lb/g/oz/ units, , Battery, Set points, Hold, HI/OK/LO
Keyboard	24-key flat membrane panel

Environmental

Operating Temperature	–10 to +40°C (legal); –10 to +50°C (industrial)
Storage Temperature	–25 to +70°C
Humidity	0–95% relative humidity
Altitude	2000 m (6500 ft) maximum

Enclosure

Enclosure Dimensions	18.6 cm x 9.5 cm x 10 cm
Weight	0.4 Kg (without battery)
Rating/Material	White ABS